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In discussing under another head the corporation tax which has just been enacted by congress, the question of its constitutionality is not touched on. President Taft, in his message of June 16, proposing this tax, refers to the decision of the Supreme Court in the case of Spreckels v. McClain as establishing the principle "that such a tax as this is an excise tax on the privilege of doing business and not a direct tax on property, and, therefore, is within the federal power without apportionment according to population." The Spreckels case came up under the war revenue act of 1898, which imposed a tax of ¼ of 1 per cent. on the gross receipts, in excess of $250,000, of every person, firm or corporation refining petroleum or sugar. But the present law differs radically from the one held legal in the Spreckles case, in that it taxes net income and not gross, and that it taxes only corporations and not every form of business. Justice Harlan, writer of the opinion of the court in the Spreckles case, says: "Clearly the tax is not imposed on gross annual receipts as property, but only in respect of the carrying on or doing the business of refining sugar. * * * It cannot be otherwise regarded because of the fact that the amount of the tax is measured by the amount of the gross annual receipts." The tax now established, President Taft says, is a tax on "success and not failure." The thing taxed, therefore, is not the privilege of engaging in a particular business, but the achievement of showing profits in a particular business. From the wording of Justice Harlan's opinion in the Spreckles suit, it appears that each case of federal excise tax will be considered by the court as standing on its merits, and therefore President Taft's statement made in regard to this general tax on *net* earnings and applying only to corporations, is not necessarily the last word on the subject of the act's legality.

Governor Deneen is still playing politics with the Illinois Railway Commission. Two years and a half ago, when the Commission was reorganized, Mr. Deneen appointed to it three gentlemen who were successful both as politicians and in their private affairs, but none of whom had a single special qualification as a railway commissioner. The man who came nearest to being fit, perhaps, was W. H. Boys, who was made chairman. He was a good lawyer and devoted himself with energy and intelligence to the work of the Commission. Recently, however, after he had enough experience to get some real insight into railway affairs, Mr. Boys resigned to return to his law practice; and Gov. Deneen has appointed as his successor Orville F. Berry, who has been for some years a member of the state senate. He owes his appointment entirely to the fact that he is an active and adroit politician, who has twice helped Mr. Deneen get nominated and elected as governor, and has supported his policies in the legislature. No one suspects Mr. Berry of having any special knowledge of railway matters or any special capacity for dealing with them. Mr. Deneen would not say that a lawyer or a carpenter was a fit person to appoint to a board of health. Nor would he say that a blacksmith, a merchant or a physician should be appointed to the bench, or even as a member of the board to examine applicants for admission to the Illinois bar. The railway business is as highly specialized as the medical or legal profession. A knowledge of it that is broad enough and thorough enough to fit a man to decide intelligently and fairly the numerous perplexing questions that arise in connection with the public regulation of railways is far harder to acquire than the knowledge and skill necessary to try most lawsuits or to perform most surgical operations. And yet, while it is thought that only lawyers are fit to be judges, and only physicians are fit to cut out appendixes, Gov. Deneen acts on the assumption that any adroit and friendly politician whose mind is sufficiently unprejudiced regarding railway matters is fit for a railway commissioner. It is fair to say that Gov. Deneen is not alone in this view. It is shared by most governors and most of the public. The policy of making railway commissioners of men who know nothing about railways would not be so bad if it were supplemented by a policy of making their tenures of office near enough permanent for them to have time to use for the benefit of the public some of the knowledge that they acquire during the student period of their service. In such a state as Illinois the railway commissioners should be paid $7,500 to $10,000 a year instead of $3,600 as now; they should be chosen for their knowledge of railway affairs, not for their knowledge of politics; and they should be kept in office during good behavior. Until such a policy is adopted government regulation of railways will continue to be, as now, in some states wasteful and almost criminal, and in others a poor and stale joke. New Hampshire, as fitly as Illinois, might have been taken as the text for the foregoing homily, if we may judge by the newspaper accounts.

Vice-President Rea of the Pennsylvania Railroad has written to the Interstate Commerce Commission and to capitalists and others interested in railway affairs suggesting that the government should change the date on which it requires annual reports to be made by the railways. At present every railway in the country must report to the Interstate

Commerce Commission for the twelve months ending with June 30 without regard to whether or not that is the fiscal year of the company. The Pennsylvania's year ends December 31, and the New York Central, formerly closing its year on June 30, has made the change to December 31. Professor H. C. Adams, Chief of the statistical department of the Interstate Commerce Commission, responding to the suggestions which have been made, has sent out a circular asking the views of the managers of all the roads in the country. The new law imposing a federal tax on corporations, going into effect this year, at once emphasizes the question of the proper period to be adopted for a fiscal year as the tax is to be assessed at the end of the calendar year. Professor Adams is chairman of the committee on statistics of the National Association of Railroad Commissioners. The first reason stated by Mr. Rea, in his proposal to make the government year conform to that of the Pennsylvania Railroad, is that the commission will then have time to submit its annual report to Congress at the opening of that body in December, whereas, under the present arrangement the five months between June 30 and December 1 is not a sufficient time. Inasmuch as the presentation of the report to Congress is not an event of absorbing importance this reason would seem to be deficient in strength. The statistical report is given to the press whenever it is ready regardless of the date of the report sent to Congress. Of more importance is the second reason—that some companies are obliged to make a report for the calendar year for submission to state authorities. This appears to be true to some extent notwithstanding the efforts of state railway commissioners for many years past to make the requirements of the states correspond as closely as possible with the requirements of the federal government. The third reason presented by Mr. Rea is that the calendar year is the logical year. Railways usually make up their budget of proposed improvements on the basis of what they expect to do between January 1 and December 31. Winter is the best time to draw the line between old jobs and new ones. Again, the reports for a year ending June 30 must be made up in the summer, which is the time when the clerical forces of the railways are busy on account of traffic being at its height and when also the clerks have to have their vacations. It seems likely, therefore, that Professor Adams will find a large majority in favor of making a change. The tax law, however, will still require a lot of separate statements.

HOW TO BE A FIRST CLASS TRAINMASTER.

The first prize article on the above subject appears on another page. On May 7 last the *Railroad Age Gazette* offered a premium of $75 for the best article, and a second prize of $50 for the second best article written by a trainmaster of at least one year's experience in that position within the past three years. In this competition there were contestants from 25 different railways. Although all the papers were creditable, nevertheless, the processes of elimination were not difficult for a considerable proportion of them. The final selection was left to Mr. Besler, vice-president and general manager of the Central Railroad of New Jersey, and Mr. Harahan, assistant to the president of the Erie Railroad. It would not be easy to find railway officers more capable. They are both operating officers of ability and experience and both are sons of railway officers of similar training and service. They went at the work seriously, reading many of the papers a second time. They cordially agreed in awarding the first prize to C. B. Wildman, trainmaster of the St. Louis, Iron Mountain & Southern, at Van Buren, Ark. They disagreed, however, as to the contestant entitled to second place. The cause of this disagreement is in itself interesting. One of the articles was a scholarly statement of the general principles and rules applicable to the trainmaster's duties. The other was an illogical but highly interesting statement of the difficulties met and overcome in the writer's own experience. When these doctors so disagreed it seemed to be the editor's plain duty to recognize the value of both Mr. Harahan's and Mr. Besler's judgment by paying an additional second premium, making no distinction in the rating of the two papers. These second prize men are: F. L. Rodman, trainmaster, Atlantic Coast Line, Savannah, Ga., and J. J. Pruett, trainmaster, St. Louis division of the Vandalia, Terre Haute, Ind. A suggestion made by one of the judges in this case will be carried out. The trainmaster's duties involve so many subjects that no one of the papers has dealt with all of them, and a composite paper will be made of the good points discussed by the other contestants, to be published after the three premium articles are published.

There are many other interesting features, which an examination of these competing papers makes plain. One is that a thoroughly capable man is often incapable of telling what he knows best. This observation does not take into account literary form or methods of expression. We all know men of the foreman class, men with zeal and ability fully equal to the tasks assigned them, who are quite incapable of making a report on their own work or anybody else's work. It is generally true, however, that the man with a capacity for being the head of any department, with power of growing and earning promotion, can make a clearly understandable statement both of the scope and of the details of his job. Reading these papers also gives one a greater respect for the trainmaster, the man of many functions; the eye of the superintendent, as he is sometimes called.

THE BOSTON HOLDING COMPANY HOROSCOPE.

About a decade and a half have passed away since the railway situation in New England went through a series of dramatic episodes. It was what may be called the first period of rapid railway consolidation in that region. President McLeod, of the Reading system and the Boston & Maine, a man who, whatever would be thought of him to-day was then regarded by conservatives as visionary, radical and speculative, was planning a union of the two systems. President Clark, of the New Haven system, was, on the other hand, pushing and planning consolidation eastward and northward. The climax of the situation came in a "deal" by which, share for share, New Haven stock was to be exchanged for Connecticut River Railroad shares and Boston & Maine territory thus formally invaded. It was thwarted by the purchase at a great price of private holdings of Connecticut River shares by the agents of McLeod, who also sought control of the Old Colony system, with its boat lines, which would have been a counterstroke at the New Haven. But McLeod's radical ambitions and the then fiscal weakness of his Reading base line had scared conservative railway New England. McLeod himself was turned down and out; the Old Colony with its Boston terminal and profitable boat lines went to the New Haven under lease; and then followed what was called the "partition of Poland" under the terms and policy of which the New Haven was to limit its activity to the region south of the Boston & Albany—which thus became in a railway sense a kind of New England equator—and the Boston & Maine was to confine its ambitions to the region north of the Boston & Albany. As now recalled, the "partition" treaty was never printed, perhaps never even put in writing or ratified officially by directorates. But for many years it was in the nature of a practical working agreement and a bond of policy.

All that is changed now. The first period of New England railway consolidation has been followed by another and the "partition of Poland" becomes a dead historical letter. The overt act, justified by new conditions, was the purchase by President Mellen of the 110,000 shares of Boston & Maine stock. And the final outcome now, after a long spell of resistance and of foamy foolishness in Massachusetts, is the

Boston Holding Company, authorized by the state legislature, and which is to take over the Boston & Maine control while itself under the control of the New Haven. That holding corporation thus obviously becomes the center of the arch upon which New England railway monopoly is to rest. As such its scope, powers, composition, restrictions and potentialities are points of more than passing interest.

Its capitalization or the shape of its fiscal control must be looked upon as a mere detail and not of deep import. It suffices to say that financially the holding corporation will be as small as otherwise it is big, and with the New Haven company owning the great majority of its stock. In the financial direction, in the operation of the Boston & Maine and in the choice of directors the influence of the New Haven is paramount, subject only to the proviso that a majority of the officers and directors shall be citizens of Massachusetts. This last restriction was emphasized considerably before the Massachusetts legislature. Well enough as a sop to state pride, but as a sentimental ingredient of the control it becomes practically a trifle. The New Haven can find as strong friends in Massachusetts as in Connecticut, New York, or Rhode Island and can elect "dummies" if it wants to. What is there even to prevent President Mellen himself, with a summer home in Stockbridge, Mass., from entering the directorate as a "citizen" of that state and making the legal state majority of one? The proviso only serves to throw a new sidelight on that narrow local and provincial prejudice which in the Massachusetts legislature and courts obstructed in so long and costly a fashion the inevitable merger.

But, contingently at least, the other restrictions of the act of incorporation of the holding company are of greater importance. The Boston & Maine stock held by the new corporation cannot be sold without express consent of the state legislature and any proposed sale must be investigated by the railway commission, which is to report upon its expediency. The New Haven—or any other railway corporation—holding stock in the new company cannot sell except by express legislative authority and the state reserves the right, on making due compensation, of buying out the holding company with all its stock, bonds and notes. On the face of the act of incorporation this gives the state a "big stick" in its sheath. This may serve in the future of Boston & Maine control, as a sentimental force on the control should actual abuse relating to public necessity and convenience arise in the operation of the road, and to that extent be beneficent; or, on the other hand, it may give the holding company a good opportunity to sell out. But neither contingency is in the least degree probable. As a practical proposition will the New Haven ever part with a property possession of which pledges the railway domination of New England? On the other hand, except in some remote and improbable era of general state control of railways, will Massachusetts in any spasm of demagogism undertake purchase and management of a great railway system? At bottom and, as a practical theorem, do the provisos for and against transfer of the holding company's interest amount to much more than the "alter, amend or repeal" rule applicable to corporation charters granted by states but almost never exercised?

Analyzed throughout and as a whole the Boston Holding Company looks strikingly like a mask for the retreat of Massachusetts from a position as untenable both in law and facts as that from which the federal government lately receded when it nolled the New Haven suit under the Anti-Trust Act. Ministering to state pride in strong words, the holding company act leaves the New Haven in possession of the substance, or at least so far as that substance can be measured by past railway history. The act goes further and positively ratifies the Boston & Maine merger. With that accomplished the second period of railway consolidation in New England closes and its results begin. To some of those prospective results we have heretofore referred—the unifying of railway operation in that region of intensified high-class traffic, dictation of rates, and to put the case mildly, complicated relations with connecting roads. And remote perhaps, but looming larger, is that Harriman "sphere of influence," which through the New York Central now begins to touch New England closer, and at both the New York and Boston terminals is already on common ground with that New Haven dominance in six states which the Boston Holding Company has consummated and confirmed.

THE ELECTRICAL ENGINEER AND THE STEAM RAILWAY.

The outlook of the electrical engineer is gradually piercing the walls of the power-house and is no longer confined in direction to the line traced by the transmission system. A few years ago assertions to the contrary were common; nor were they unwarranted. It was asserted, also, that given enough data for the formation of certain equations with reference to the comparative merits of electricity and steam as a motive power, the electrical engineer was prepared to stake his reputation on the correctness of the values determined for the unknown quantity because of the mathematical accuracy of his calculation, and considered as trivial any suggestion as to the completeness of the statement of his problem or as to the constancy or variability of certain of the factors entering into it. Combining these two general statements, it may be gathered that it was difficult sometimes to determine whether the student of electrical possibilities needed to be treated for astigmatism or algebra; or whether myopia were not responsible for the eccentricities of both his visual and his mathematical attainments.

So long as the problems propounded were intended as a test of theoretical nimbleness rather than of practical capacity, it may have been admissible for the terms in which the proposition was handled to be as greatly at variance with actual values as those in the primary text book "example" in which apples and pigs are indiscriminately rated at 50 cents apiece. But those few electrical engineers who early had an opportunity to substitute for insignificant letters and figures actual dollars and cents, and to correlate the conditions of time and distance to the requirements of fact and possibility, soon began to prepare "copy" which was really valuable as textbook material for the education of the future student of electric railway science.

Some such train of thought as the foregoing is suggested by the numerous discussions which have taken place in the railway clubs, on "electric nights." These discussions have plainly shown that many electrical engineers, after seemingly long delay, have put off the swaddling clothes in which, it was commonly believed by steam railway men, they had decked themselves. Whether this has come from a partial fulfillment of the wish once expressed in one of these discussions, that electrical engineers and steam railway men could be together all the time as they are at such meetings, it is not necessary to inquire. In whatever manner the change is accounted for, it appears that electrical engineers are approaching the problems presented in connection with the electrification of steam roads and the electric equipment of shop plants in a more receptive state of mind than used to be the case. On the other hand, the attitude of the railway man has changed from that of ironical curiosity to one of active and open-minded interest. The electrical engineer has discontinued largely his feat of juggling with fictitious values, and his audience of railway men no longer gazes at his blackboard demonstrations as at the feats of a prestidigitator. As has been said in substance at one of these gettings-together: "The electrical engineer is proving his cost estimates," and again, "No more difficult problems remain than have been met. The electrical engineer is get-

ting a hearing on the merits of his proposition and not because his hearer is in a position in which he must listen."

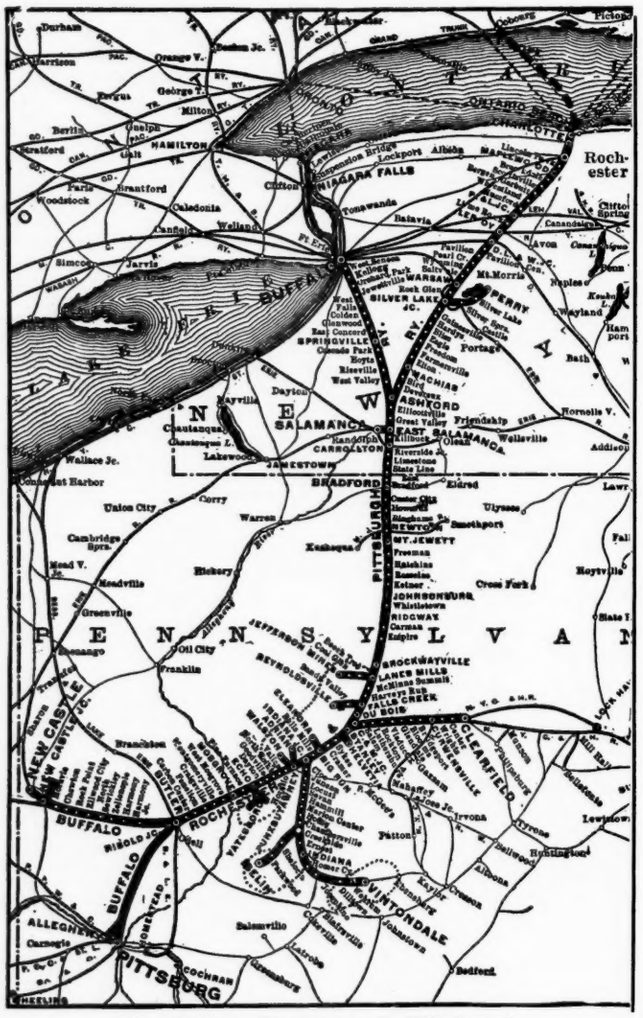
Probably it would be unfair to attribute to any of the acknowledged experts in electric traction any of the extravagant views about the early disappearance of the steam locomotive which have generally been attributed to the profession they represent—though many times some of them have seemed to be far too good-natured to the frothy press agent. They have doubtless seen and acknowledged to themselves the economic limitations of electric power as applied to traffic conditions which are still and must be for many years the rule in this country. Nevertheless, the steam railway man must be forgiven a quiet chuckle over the acknowledgment on the part of one of these his brethren that before the steam locomotive goes to the scrap heap there will be a "heap of a scrap"; and that by another it is estimated that existing steam locomotives might be replaced by electric power if manufacturers did nothing but manufacture power for twenty years and if the requirements of traffic maintained a convenient *status quo*. We are now pretty much agreed; the lion and the lamb are at last couched together; and the tiger and the harmless, necessary cat partake of their sustenance from the same platter.

In this period of mutual confidence, in which the electrical engineer is prepared to admit that the value of present equipment that must be discarded under a new regime must be taken into account in his calculations, and when the railway man is of a receptive mind regarding possible ulterior benefits that may follow a change of motive power under a certain set of conditions, it may reasonably be expected that satisfactory results will follow undertakings predicated on the findings of a joint tribunal constituted of these elements. The railway man can well afford, in the preliminary hearing, to consider some of the points which have been made in the occasional discussions to which reference has been made. Some of these have received so little public consideration that they are still novel. In the case of the New York Central, when it is stated by the officer responsible for planning its extensive terminal improvements, that by the use of a practicable portion of its "air rights"—the addition of the equivalent of two blocks to its frontage by means of superimposed structures impossible when steam was used as a motive power—that road can increase the value of its terminal by $50,000,000, it is evidently worth while to figure as to the feasibility of other elements involved in the change. This, of course, is an exceptional instance in which congested population and property costs unite to form a coefficient of high value. Many comparable situations have already been the subject of careful study. The use for collateral purposes of surplus power from a source necessarily designed for a maximum load is a question which merits much more consideration than it receives; for the demand thus created may be met with no additional expense whatever beyond the cost of burning extra coal under the boiler. Switching yards seem to afford still more frequent opportunities for the application of electric power to railway service; and the possibilities of utilizing the electric current for the control of signals and perhaps other safety appliances are not beneath notice.

On the opposite side of the case, the electrical engineer can afford to put in the background, for a time at least, any predilections he may have as to phases and frequency, systems of transmission and methods of control—all the details of apparatus which do not vitally affect the determination of the general question. The gasolene electric car has made for itself a record which must be taken into account under certain classes of conditions. He will show himself the most thorough master of his profession at its present stage, and contribute most to its advancement and that of railway science in general, who brings to the study of each individual problem the mind freest from bias and most open to conviction, even to the upsetting of his most cherished theories.

THE BUFFALO, ROCHESTER & PITTSBURGH.

The year ended June 30, 1909, is the second full year in which railways have made reports according to the classification prescribed by the Interstate Commerce Commission, and the report of the Buffalo, Rochester & Pittsburgh is the first one in which the figures for two years are directly comparable without reclassification. The report of the B., R. & P., however, does not give detailed statistics for expenses, so that it is not a good example to use in judging of the value of the classification prescribed by the Interstate Commerce Commission. Of course, the figures that are given are compiled according to this classification both for 1908 and 1909



The Buffalo, Rochester & Pittsburgh.

and the terms and methods of bookkeeping used in the income account and other accounts are the ones prescribed, and it will be simpler to use these terms in discussing the report for 1909 and change our usual table, showing a comparison of the operations of the road for the last two years to correspond to the Interstate Commerce Commission's terminology and arrangement.

In studying the rather discouraging report made by the company it must be remembered that the Buffalo, Rochester & Pittsburgh is a soft coal road and is affected by the conditions in the iron and steel industries in and around Pittsburgh to a degree that makes its earnings a reflection rather of conditions in the manufacturing industries and in the soft coal trade, than of railway earnings generally. Bituminous coal forms about 65 per cent. of the total freight tonnage, and in 1909 there was 5,190.000 tons of this coal carried, as against 5,850,000 in 1908. It is due almost entirely to this falling off

in coal tonnage that the total tonnage carried decreased by over 10 per cent. Freight other than coal, coke and iron showed a tonnage carried of 1,860,000 in 1909, as against 2,100,000 in 1908.

Total operating revenue last year amounted to $7,170,000, a decrease of $300,000 from the previous year, and operating expenses amounted to $4,670,000 last year, a decrease of $690,000 from the previous year. This saving in operating expenses is partly offset by a decrease in income other than from operations of $390,000, this income in 1909 amounting to $440,000. This was due in part to the change in the per diem rate and in part to the falling off in coal and coke shipments, as a result of which an average of about 33 per cent. of the freight service cars were idle during the year.

After the payment of fixed charges there was a surplus of $1,030,000 available for dividends. This is almost the same as the amount shown last year, but in 1908 5 per cent. was paid on the common stock, the dividend not having been reduced to a 4 per cent. annual basis until the second half year, while 4 per cent. was paid in 1909. This made a saving of a little over $100,000 in dividend payments and left a surplus credited to profit and loss of $250,000.

The details of operating revenues show that while the number of passengers carried totaled 1,520,000 in 1909, as against 1,620,000 in 1908, the average revenue received per passenger was 58.39 cents last year, as against 58.03 cents in the previous year, and the average received per passenger per mile was 1.976 cents as against 1.854. This increase in revenue per passenger per mile is probably in part due to a restoration of the 2½-cent per mile rate for passengers, which followed the granting of a permanent injunction restraining the enforcement of the 2-cent fare law in the state of Pennsylvania. Freight revenue amounted to $6,000,000 last year, as against $6,340,000 in the previous year, and the amount received per ton per mile was 48.2 mills in 1909 as against 48.9 mills in 1908.

The saving in operating expenses was quite evenly distributed except that both traffic and general expenses increased slightly. Transportation expenses, which amounted to $2,095,000 in 1909, as against $2,420,000 in 1908, were 29.22 per cent. of gross earnings last year as against 32.39 per cent. in the previous year. The unit costs of maintenance of equipment are not shown, but the total cost in 1909 was $1,540,000, a decrease of $180,000 from the previous year. In both years operating expenses are charged with depreciation and "replacement of property-equipment" is credited. The cost of all equipment purchased or built is then charged to this "replacement of property-equipment" account. There was charge for depreciation of equipment of $232,000. This is on equipment carried on the balance sheet of June 30, 1909, at a value of $12,870,000. Maintenance of way cost $769,000 last year as against $951,000 in the preceding year. This is at the rate of $863 per mile of first, second, etc., track (two miles of switch tracks and sidings being counted equal to one mile of first or second track) in 1909, and $1,080 per mile in 1908. This is per mile *operated* and when it is recalled that the Buffalo, Rochester & Pittsburgh has trackage rights on 208 miles of track out of a total of 1,031 miles of track operated, the figure for 1908 seems very large indeed, and the 1909 figure entirely ample for first class maintenance.

Like the other soft coalers, the train load of the Buffalo, Rochester & Pittsburgh is very large, and in 1909 it increased by 67 tons over the 530 tons train load of 1908. The average number of loaded cars in freight trains was 19 last year as against 17 the year before, while the average number of empty cars remains the same, being 12. The car loading last year was heavier, the average number of tons of freight per loaded car being 31.28, as against 30.99 in 1908.

At the close of 1908 fiscal year the company had rather a small working capital, cash on hand amounting to $1,500,000. During the year there were issued $1,735,000 consolidated mortgage 4½ per cent. bonds to replace a like amount of underlying obligations and the net result of the sale of bonds and notes and the retirement of securities is an increase of $852,000 in the bonded debt outstanding. Cash has been increased during the year and amounted to $2,050,000 on June 30. At the same time, materials and supplies decreased from $1,160,000 in 1908 to $690,000 in 1909. A rather interesting change on the balance sheet that does not seem to be explained anywhere in the report is an increase in traffic balances due from other companies, from $70,000 to $630,000, and a decrease in the balance due from individuals and companies from $635,000 to $174,000. Total current assets in 1909 amounted to $2,930,000, being a slight decrease from the previous year, and total current liabilities amounted to $1,300,000, also a slight decrease from the previous year.

It is too early in the present fiscal year to make much of a prediction as to what the prospects of the B., R. & P. are for the coming year, but the bituminous coal and coke trade should improve with the present marked improvement in manufacturing and in the steel and iron industries and the earnings of the B., R. & P. should show a proportionate increase. The following table gives a comparison of the operations of the company for the last two years:

	1909.	1908.
Miles operated	570	570
Freight revenue	$6,001,572	$6,338,934
Passenger revenue	887,625	939,834
Total operating revenue	7,171,897	7,480,028
Maint. of way and struct.	769,037	951,201
Maint. of equipment	1,538,191	1,721,845
Traffic	101,259	95,769
Transportation	2,095,212	2,424,529
Total operating expenses	5,665,171	5,350,660
Taxes	133,000	175,248
Operating income	2,373,092	1,961,349
Gross corporate income	2,809,905	2,787,451
Net income	1,042,422	1,036,192
Dividends*	792,484	898,203
Surplus	249,939	127,989

*Includes $12,483 appropriation for pension fund in 1909 and $13,203 in 1908.

THE CORPORATION TAX LAW.

Railways have been taxed in about every way that ingenious legislators could think of, and of all the innumerable ways that have been tried, that based on a percentage of the net earnings is one of the most inequitable and troublesome; yet that is the method which was chosen by President Taft and which now is the law throughout the United States. As the President's chief object in promoting this law has been, avowedly, to provide an entering wedge to be used in giving all necessary or desirable publicity to corporations' books; as corporations other than carriers are, evidently, more prominent in his mind than the railways, and as he has had ten years' experience in the courts, the most reasonable conclusion would seem to be that he has deliberately concluded that the main desideratum was a law; the question whether the law is good or bad to be decided later.

For the present, then we have a Federal law taxing net earnings.* In substance this law provides for a federal tax, to be paid to the collector of internal revenue, of 1 per cent. on the net income of corporations for the calendar year. The tax is to be collected on the net income for the 1909 calendar year. The first $5,000 net income of a corporation is exempt, so that corporations earning less than this amount net will not be taxed. All corporations and joint stock companies, both public and private, are subject to this law, with the exception of labor unions and mutual benefit associations, and corporations, no part of the net income of which inures to the benefit of any private stockholder or individual, such as charitable associations. Net income is to be arrived at by the deduction from gross earnings of all expenses and losses, depreciation and interest on bonded and other indebtedness; but where the bonds and indebtedness exceed the amount of capital stock outstand-

*Section 38 of the Tariff law; reprinted on another page.

ing, interest on the amount in excess will be added to net income and taxed accordingly. Foreign corporations will be taxed on the net income of business done in the United States. A corporation owning stock in another corporation, which other corporation has been taxed under the law, does not have to include in its income the dividends received on such stock. The collector of internal revenue is given power to appoint accountants to examine (with the approval of the secretary of the treasury) the books of corporations of which he has reason to believe the accounts have not been properly stated, and penalties are provided for the misstatement of accounts and for future to send in accounts at the time prescribed.

The first criticism of the law by railway accountants will be that it requires two annual reports, one June 30 and one December 31. Assuming, however, that the Interstate Commerce Commission will change the date of the full report from June 30 to December 31—as it has the power to do, and as probably the majority of the railways would be glad to see it do—we still have questions in plenty.

Even if the two fiscal years are made to terminate together there will still be two different reports to make, because the tax law deals with actual cash receipts and payments, and not with the debits or credits accruing, as is the case in all ordinary accounts. The single item of interest on bonds and other indebtedness will make a decided difference between the ordinary or logical report, and the report which is called for by the tax law, as such interest payments universally are made after the end of the period in which they accrue.

What shall be the sum of the net earnings of a railway has always depended, in practice, in the great majority of cases, on the freedom or lack of freedom with which the operating expense account is charged with little items which under a strict construction ought to be classed as betterments and charged to capital account. Just about the day on which the tax law was finally settled, Professor Adams issued the circular referred to in our last issue, page 223, prescribing in great detail just how items of this nature shall be classed. These items often are legitimately debatable, and therefore, looking at the question narrowly, there is an advantage in having an arbitrary paternal government decide just what course to take with each. Whether to charge to capital the cost of the wicks in the lantern used by the conductor of a work train temporarily engaged in laying new second track, especially where he works mostly by daylight, has caused many an auditor a deal of unnecessary worry, and it will be good to have this burden taken off his mind by the government. Aside from petty details, however, the long standing practice of freely charging additions and betterments as part of expenses must now be changed, and we shall have two government bureaus—Professor Adams' and Internal Revenue Commissioner Cabell's—instead of one, to call to account any luckless auditor who fails to realize his responsibility to the government.

In view of the intensified "human nature" pervading the minds of railway accountants and railway lawyers it is not by any means unimaginable that the tax collector may differ with the railway representatives as to the correctness of half the reports presented to him. Whether or not this potential difference of opinion or view will cause actual dispute and delay in the collection of the taxes is hard to tell. With a government bureau straining every point to secure the highest accuracy, and taking two years to accomplish its object, the completion of the tax returns of any given year might take many months. Railways, as between themselves, have settlements as, for example, those for freight care hire, hanging fire two and three years very commonly. On the other hand, the smallness of the new tax, which will lead railways to put up with what they deem injustice rather than begin a protest which may be made public, and the fact that the internal revenue commissioner is empowered to examine a corporation's accounts only when he suspects that they are wrong, will tend to prevent controversy. It is quite possible that controversies will be rare. This last provision, that the government shall have the power of examining accounts, but yet shall not exercise that power except on the basis of suspicion, is the most illogical feature of the law. It is inconsistent with President Taft's fundamental idea that the most useful function of the law is to enable the government to know what the corporations of the country are doing. The law assumes all tax returns to be right until there is evidence that they are wrong; but "business principles," in the language of Herbert Spencer, "require that things shall not be supposed to be going right till it is proved they are going wrong; rather, we should suppose that they are going wrong till it is proved they are going right." As our law now stands the situation is similar to that of our state laws taxing personal property, which everywhere encourage evasion and dishonesty.

While the internal revenue collector is not to examine the books of a corporation unless he suspects something wrong, nor without the assent of the secretary of the treasury, he can, so far as railways are concerned, go over to the office of the Interstate Commerce Commission and there find out everything—assuming that the statistician of the commission carries out his plan of requiring the railways to report fully and intelligibly on every feature of their financial affairs. This method of securing justice, however, must be carried on in the face of two serious drawbacks; in the first place, the Interstate Commerce Commission, unless it shall have a greatly increased appropriation, will not be able to report the correct figures for any corporation until a year or two after the tax is due; and secondly, those corporations which are not carriers and are not subject to the authority of the Interstate Commerce Commission would enjoy an advantage, as regards the tax law, as compared with the railway companies.

The law implies that the ideal method of financing is to issue exactly as much stock as bonds. A road having no bonds, such as the Delaware, Lackawanna & Western, has got to treat as net income everything that it earns over and above running expenses and rentals, while the Atlantic Coast Line Company, for example, which has $12,600,000 stock outstanding and $13,000,000 bonds, does not have to treat the interest payments on half of its capital as income at all. In this provision the law will work glaring discrimination. A railway company needing money is likely to issue either bonds or stocks, according to the market for securities at the time. Nearly always it is simply a question of which form of security will bring the better price to the railway company; and to arbitrarily tax the interest in the form of dividends paid on money put in by stockholders and not tax the interest paid on money loaned by bondholders is to make a discrimination in favor of a road which has happened to issue an amount of bonds equal to or in excess of its stock. The law provides, however, that fixed charges on bonds equal in amount only to the capital stock outstanding shall be deducted before arriving at income, and that interest on bonds in excess of capital stock outstanding will be treated as part of income. Therefore, a road which has gone to the other extreme—one that has found it more convenient to issue bonds than stock—will be taxed on this excessive bond issue. For instance, the Pennsylvania has $314,604,200 stock outstanding and $300,734,110 bonds outstanding; it will therefore pay no tax on the interest of its bonds. The New York Central & Hudson River, on the other hand, has $178,632,000 stock outstanding and $268,414,845 bonds outstanding; it will therefore pay a tax of 1 per cent. on the interest paid on $90,000,000 bonds, being the excess of bonds over the stock.

The discrimination against roads that have issued more bonds than stock is, however, not very serious as compared with the discrimination against the road that has done its financing largely by the issue of stock. The following table gives all of the principal roads operating over 1,000 miles, with the stock outstanding and the bonds and indebtedness outstanding. The figures have been taken from the balance

sheet given in Poor's Manual of 1909, the balance sheet being generally that of June 30, 1908. These figures in many cases may not represent the exact sums which the tax collector will deal with, but until the law has been more fully interpreted, it is perhaps not worth while to attempt greater accuracy. The terms "bonded and other indebtedness" may be interpreted in different ways. We have taken what would apparently be the fairest interpretation in each case. For instance, equipment trust notes have been added to mortgage bonds and treated as part of outstanding indebtedness. The Lackawanna is included in the table because, although not quite a thousand miles long, it is the shining example of the class of corporation that will be hardest hit by the new tax. The United States Steel Corporation is also included in the table.

Comparison of Outstanding Securities.

Name.	Outstanding— Stock.	Bonds and indebtedness.
Atchison, Topeka & Santa Fe	$217,130,230	$315,454,420
Atlantic Coast Line Co.	12,600,000	13,000,000
Atlantic Coast Line R.R.	50,134,200	145,186,550
[1]Baltimore & Ohio	212,175,829	255,532,430
Boston & Maine	31,395,266	30,373,000
Chicago & North Western	124,351,686	164,923,000
Chicago, Burlington & Quincy	110,839,100	183,064,000
Chicago, Milwaukee & St. Paul	198,533,305	125,679,500
Chicago, Rock Island & Pacific Lines	75,000,000	204,801,541
Denver & Rio Grande	83,779,800	102,825,000
Cleve., Cin., Chicago & St. Louis	57,056,300	70,612,727
Erie	176,271,300	216,463,900
Great Northern	209,962,750	234,010,909
Illinois Central	95,040,000	159,819,275
Louisville & Nashville	60,000,000	136,616,500
Missouri, Kansas & Texas	76,300,300	112,219,927
Minneapolis, St. P. & Sault Ste. Marie	25,200,000	55,295,000
Missouri Pacific	79,753,985	100,713,000
New York Central & Hudson River	178,632,000	268,414,845
New York, New Haven & Hartford	97,895,700	232,552,750
Northern Pacific, incl'd'g bonds assumed	217,881,836	297,852,739
Pensylvania Company	60,000,000	127,112,548
Pennsylvania Railroad	314,604,200	300,734,110
[2]St. Louis & San Francisco	50,000,000	134,624,998
[3]Seaboard Air Line	60,913,500	95,081,500
Southern Railway	180,000,000	251,936,467
Southern Pacific	[4]335,416,272	371,498,122
[5]Union Pacific	295,032,000	298,109,068
Wabash	90,854,306	118,047,233
Chesapeake & Ohio	[6]62,790,700	123,701,354
Louisville & Nashville	60,000,000	136,616,500
Central of Georgia	5,000,000	55,934,248
Colorado & Southern	48,094,722	59,548,010
International & Great Northern	1,775,400	3,192,000
Lake Shore & Michigan Southern	50,000,000	150,400,000
Lehigh Valley	40,441,100	91,701,000
Norfolk & Western	89,000,000	119,265,500
Nashville, Chattanooga & St. Louis	10,000,000	15,985,000
Philadelphia & Reading	20,000,000	70,287,452
[7]San Pedro, Los Angeles & Salt Lake	25,000,000	40,000,000
St. Louis Southwestern	36,500,000	46,295,545
Texas & Pacific	38,763,810	55,059,324
Interborough Rapid Transit	35,000,000	35,033,000
[7]Delaware, Lackawanna & Western	26,200,000	.....
United States Steel Corporation	868,583,600	593,231,210[8]

[1] Not including bonds of other companies assumed.
[2] Does not include outstanding securities on leasehold estate or of auxiliary companies.
[3] This is the capitalization of the proposed reorganized company.
[4] Preferred stock has been called in since.
[5] Does not include stock of Oregon Railroad & Navigation.
[6] No account is taken of the preferred stock of which all but a few thousand dollars is deposited in trust.
[7] Has but 957 miles of line.
[8] Exclusive of bonds held by trustee of sinking funds.

Letters to the Editor.

SUPPLY DEPARTMENT MANAGEMENT—CORRECTION.

In the tabulated figures appearing in the article on this subject on page 191, July 30, the dollar sign is erroneously used in column 5. This column represents the total mileage made by both passenger and freight cars in revenue service, expressed in thousands of car miles.

TWO MEN TO COLLECT FARES.

Pere Marquette Railroad Company,
Grand Rapids, Mich., July 24, 1909.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

I have read with interest your recent article relative to cash fares on trains and I wish to submit to you a plan which should be an improvement over the train collector and train auditor.

The plan which is outlined below should overcome the troubles your article referred to and at the same time lighten the work of the conductor on duty and relieve him of at least one hour's work making ticket reports after each run.

It should not increase expenses very much on trains that have two brakemen or a porter and brakeman, as the inspector and one brakeman can handle the train.

The inspectors should work different runs as often as possible and be under the charge of a general inspector working under the general passenger agent or general auditor.

CONDUCTOR'S DUTY.

Follow the inspector through the train and take up the transportation.

Issue train checks to all passengers except those who get off at the first stop.

Inspect all train checks after each stop and see that none have been overlooked by the inspector.

Turn in to the terminal auditor at the end of the run all the transportation collected.

TERMINAL AUDITOR'S DUTY.

Get transportation collected by conductors immediately upon arrival at the end of trip.

Get cash and ticket book from inspectors immediately upon arrival at end of trip.

Make out conductor's ticket report and mail a copy of it to the conductor so he will know it is correct.

Check the train-sold tickets turned in by conductor against the stubs on ticket book turned in by inspector and see that none are missing.

Give the inspector a copy of remittance covering the amount turned in by him.

INSPECTOR'S DUTY.

After starting on run pass through the train ahead of the conductor and request passengers to show transportation.

Inspect the transportation, see that it is all right, and if it is not proper handle it in accordance with the rules.

Sell tickets to those who have no transportation.

Pass through the train after each stop, inspect train checks and sell tickets to those who have neither train checks nor transportation. Help load and unload passengers.

At the end of run turn in ticket book and collections to terminal auditor and leave ticket book with him until next trip out.

M. J. GRIFFIN.

Contributed Papers.

THE CHANGE FROM LEFT-HAND TO RIGHT-HAND RUNNING ON THE LAKE SHORE.

The change from left-hand to right-hand running on the Western division of the Lake Shore & Michigan Southern was noted in these columns July 30, page 211. Preparations for this change were begun last spring and involved a large amount of work. The extension of a number of new passing tracks was required, also the extension of leads and outgoing tracks at coaling stations, and the extension of leads at a number of yards. These latter, as with passing tracks, are not always located in pairs, of course, owing to grades and other governing conditions, and then the approaches to yards in some places made it necessary to change the switching from one end to the other. The changing of a great many crossovers was likewise involved in order to continue them as trailing points, and in many instances they had to be relocated by placing them at the opposite ends of the sidings from their previous location. Also, the connecting points of a number of stub tracks leading into main track, especially at small stations, had to be changed to continue them as trailing points.

In some instances it became necessary to relocate tracks to industries such as grain elevators, the original industrial track being appropriated as a part of a passing track. Where there was a third track to favor a grade, or for convenience of service, it usually required the building of a corresponding fourth track on the opposite side or the provision of conveniences similar to those existing under the old conditions. In only a very few instances were tracks taken up and moved to the opposite side, instead a new track was built where needed, and the old one allowed to stand. The Lake Shore is growing into a four-track road, and future construction was thus anticipated.

There are 15 interlocking plants on this division. The procedure was to put in a duplicate arrangement, so far as indications were involved, so fixed that the new outfit could be put into service in the shortest possible time without the delay of first taking down the old signals. This was left to be done afterward, as convenient.

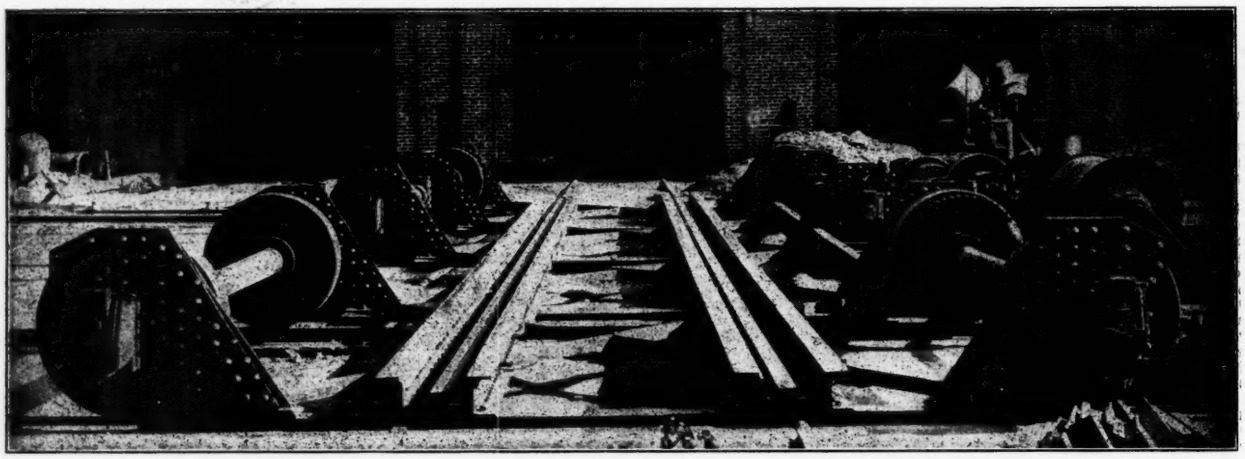
With the automatic block signals, with which the entire line is equipped, the electric wire connections were installed as far as possible and the signals moved over to the new location, so that for a few days in advance of the change the enginemen, instead of taking the indications from the old location on the left of the running track, looked across the opposite track. This proved entirely practicable both as to convenience and safety. All details of the signal change were so carefully arranged that when the moment came for the shift a large force of signal men, posted along the road, were able, in most cases, to cut the signals into service for the new arrangement behind a passing train on either track so that they would be ready for the new indications before another train came along. In most cases the changes were accomplished in from 30 minutes to two hours. Each man (usually with an assistant) had only two or three signals to look after and with a motor car was able to cover his territory quickly. Large gangs of signal men were located at the interlocking plants and made the changes quickly. All of the plants were working fully in the new service inside of eight or ten hours, the time taken depending on the size of the plant. Meantime, the track force was coupling up the new crossovers, which were previously prepared by placing the frogs and points, and in coupling up sidings which conditions had not permitted being changed previously. The track facilities were thus sufficient for handling all trains without delay on that account.

The time chosen for the change was 8.25 a.m., when the fewest trains were moving on the division. There was just one passenger train running and only four or five freights. There were very few delays. The automatic signals in a few instances did not start off right owing to mistakes in making detail changes, although the men to do this were drilled previously until they were supposed to be perfect. Several trains were thus caused to make unnecessary stops, but this did not amount to more than 20 minutes total for any one train, and by noon the signals were all working normally, and the interlockings by the afternoon. The Twentieth Century Limited train, leaving Chicago at 2.30 p.m., with a schedule of 1 hour and 55 mins. for 101 miles, lost only three minutes, this was due to slackening at interlockings. A number of other fast passenger trains arrived at division terminals in the afternoon on time. We are indebted to D. C. Moon, general manager of the Lake Shore, for the foregoing information.

NORMAL SURFACE TRANSFER TABLE.

The accompanying illustration shows a normal surface transfer table in use at the Sacramento shops of the Southern Pacific Company. The rails rest on a stringer of through section, which arrangement reduces to a minimum the distance to the surface of the ground. The transverse beams which support the stringers are carried in the conduit, which has a slot at the top. The upper flange of the 24-in. I-beam which forms the transverse beam is above the ground.

The trolley wire carrying the current to the motors is placed in one of the above mentioned conduits. These conduits are cleaned automatically by scraper blades extending from the beams, and all the debris is carried to a suitable sump at the end of the conduit, where the water drains off and the debris is removed at intervals through a man-hole. The trolley is attached to the beam.



Edinger Normal Surface Transfer Table; Southern Pacific Sacramento Shops.

The illustration herewith shows conditions during the construction of the turntable and before the top dressing was put on the ground surface. This top dressing brings the ground surface level with the top of the rails on which the table runs.

This normal surface transfer table is covered by patents issued to F. S. Edinger, Vice-President and General Manager of the Shattuck-Edinger Co., San Francisco, Cal.

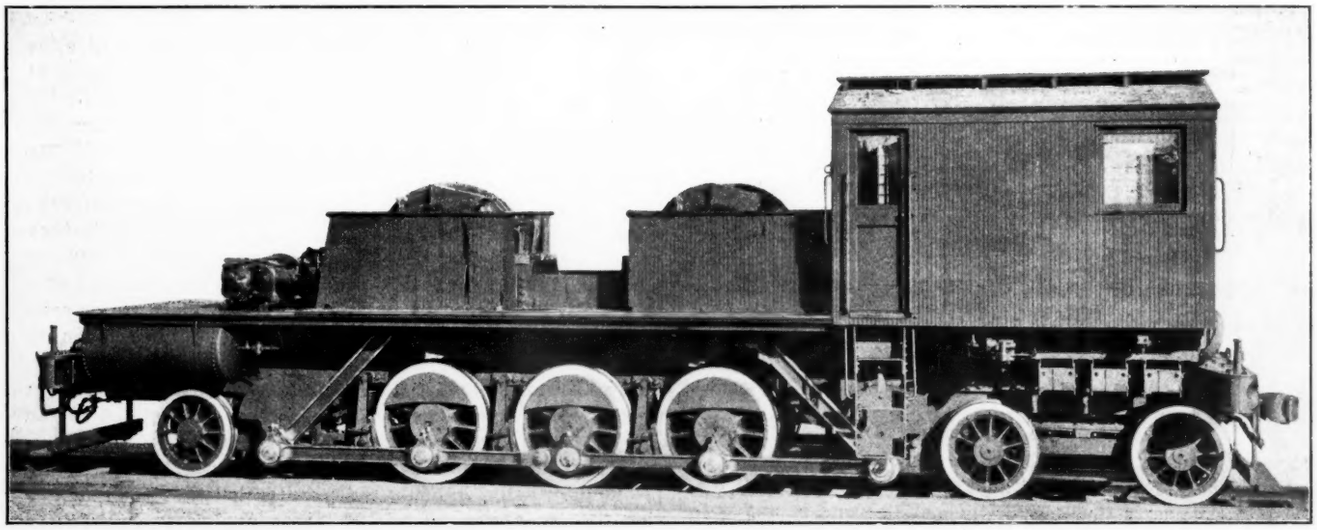
FOREIGN RAILWAY NOTES.

The German railways had a large increase in passenger earnings in May, due to the fact that holidays came in that month which were in June last year. There was a slight decrease in freight earnings.

The track was laid on the German "East African Central Railroad" June 17 to Kilossa, 186 miles west of the ocean terminus at Dar-es-Salam. This is one-third of the length of the road authorized, which from Kalossa will extend northwestward to Tabora, some 200 miles east of Lake Tanganyika.

NEW SIDE ROD EXPERIMENTAL ELECTRIC LOCOMOTIVE.

A novel type of electric locomotive has been designed and built jointly by the General Electric Co., Schenectady, N. Y., and the American Locomotive Co., New York. It was built for trying out a scheme of transmitting power from the motors to the drivers through side rods, instead of having the motors geared to, or direct connected to, the driving axles. The locomotive is designed for a tractive effort of 30,000 lbs., at a speed of 18 m.p.h., with a maximum speed of 50 m.p.h., to operate equally well either forward or backward. It has been tried out with temporary motors of a somewhat smaller capacity and these tests are said to have demonstrated that the design is satisfactory. It is intended to extend the cab over the entire length of the machine, as in the case with electric locomotives now in use. The cab and guards shown are for temporary protection of the present installed apparatus only.

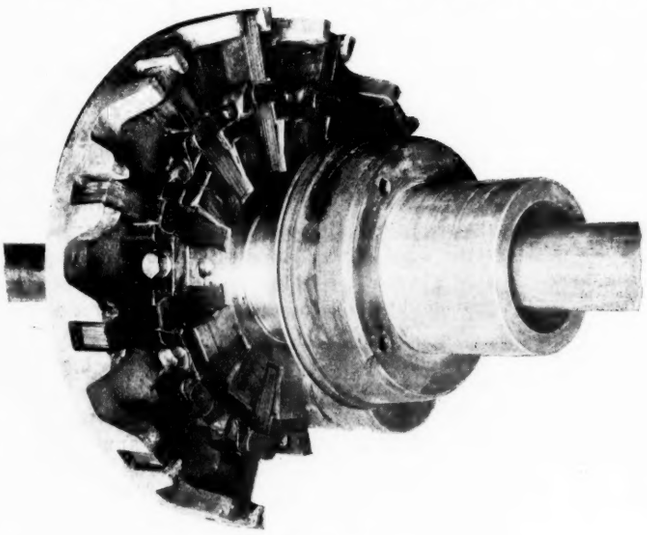


Experimental Side Rod Electric Locomotive.

The frame and running gear are seen to be similar to those of steam locomotives of the 4—6—2 type; the three pairs of coupled driving wheels are 49 in. in diameter, and the truck wheels are 36 in. in diameter. The total wheel base of the locomotive is 36 ft. 3 in., the rigid wheel base being 10 ft. The frames have two extra jaws each for carrying the journal boxes of the crank connections.

The springs are equalized between all six wheels on each side and also cross equalize. The two wheel truck has a radial center bearing and is guided by two radius bars pivoted at the center of the cross-piece between the frames, forward of the rear driving axle. The total weight of the locomotive when equipped with two 800-h.p. motors, will be 250,000 lbs., of which 162,000 lbs. will be carried on the driving axles. Each axle will therefore have 54,000 lbs., which is slightly less than the maximum weights employed on high speed steam locomotives, but is higher than the weights on either the New York Central or the New Haven Electric locomotives.

One of the principal advantages found in this type of construction is that a motor of large diameter and small air gap may be used in conjunction with driving wheels of small diameter and at the same time the motor may be spring supported. The motor bearings may also be designed to maintain a small air gap. Such a form of construction will also secure an economy in the construction of the motors, the same horse power being obtained from two motors at less cost and for less weight than in four smaller motors. The same motor equipment may also be used on locomotives having different diameters of driving wheels. This type of locomotive is adapted for operation with either d.c. or a.c. motors. They may be located so as to concentrate the greater portion of the weight near the center of the machine, with the attendant advantage that the moment of inertia of the locomotive around its vertical axis will be reduced as much as possible.



Flexible Coupling.

The electrical control is arranged in such a manner that the motors start as repulsion motors with short circuit armatures and are changed over to series repulsion motors for the higher speeds. This arrangement is designed to eliminate running with a short circuit armature on high voltage and at the same time give the high torque at starting. The tractive effort is said to be about twice as great with repulsion motor connections as with series repulsion connections, for a corresponding value.

The armatures are similar to those of an ordinary d.c. machine, having equalizer rings. They have multiple drum windings with the bars soldered directly into commutator segments. The field of stationary windings are of the distributed type, made in two sections, exciting and the inducing windings. The former has the same function as the field winding in an ordinary series motor, while the inducing winding introduces the working torque when the motor is connected as a repulsion motor. All parts of the running gear follow standard steam locomotive practice. Each motor is coupled to a jack shaft and thence to the drivers. The jack shaft springs are rigid in the spring supported loomotive frame and their centers are on a level with those of the drivers. The object of this jack shaft is to permit a horizontal drive between the spring sup-

ported part of the locomotive and the driving wheel and it is necessary in order to allow the vertical play of the spring supported part with a negligible variation in the distance between crank centers. Counter weights are used on the driving wheels to balance the side rods, and as there are no reciprocating parts, a perfect balance should be obtained.

Another interesting mechanical feature is shown in the illustration of the flexible coupling which is inserted between the armature shaft of the motor and the motor crank. This coupling is made up of a series of leaf springs arranged radially around the motor shaft and designed of such a strength to carry the entire torque of the motor flexibly with an amount of deflection which will reduce to a minimum the effect of a single phase a.c. motor.

Following are some of the principal dimensions and data of these locomotives:

Trolley voltage	10,000
Cycles	15
Rated tractive effort	33,000 lbs.
Speed at rated amperes	18 m. p. h.
Total	1,600
Number of motors	2
Type of motor	Geaz-43
Diameter of driving wheels	49 in.
Diameter of truck wheels	36 in.
Total wheel base	33 ft. 6 in.
Rigid wheel base	10 ft.
Length, total	43 ft. 6 in.
Height	13 ft. 8 in.
Weight on drivers	162,000 lbs.
Weight per axle, driving	54,000 "
Total weight	250,000 "

THE DOCKETS OF THE INTERSTATE COMMERCE COMMISSION.

BY LOGAN G. MCPHERSON.

III.

CLAIMS FOR REPARATION.

As a precaution against the payment of rebates the railways are now forbidden, without a specific order of the Interstate Commerce Commission, to make refund of any portion of the transportation charge paid by a shipper. The only exception to this rule is in the case of an overcharge growing out of an obvious clerical error; such, for example, as the insertion in a bill of lading of a rate of 83 cents when the filed and published rate is 82 cents; or in case of obvious arithmetical miscalculations such as errors in multiplying the number of tons or hundredweight by the rate per ton or hundredweight. Refund because of such obvious overcharges may be made directly to a shipper. Numerous other overcharges are made through errors of one kind or another that do not appear on the face of a bill of lading, but in which the railway company is responsible for an error only and not for a wilful infraction of its filed and published rates or regulations. Out of these arise what were formerly informal complaints only, that under no circumstances found their way to the formal docket. After several months of specific consideration of each of such complaints, the commission sanctioned a procedure for an automatic disposition or what it designates as "special reparation claims." Such a claim consists of a complaint by the shipper, together with an acknowledgement by the carrier that it committed the error complained of and is willing to pay the reparation requested. This acknowledgement in all cases that evidently and properly entitle the shipper to a refund is accepted by the commission as taking the place of a hearing and justifying an order for reparation. Such complaints, in that they do not entail an order to reduce rates or to modify any practice or to promulgate any principle, when first received are usually classed among the informal complaints and given one of the series of numbers applicable to informal complaints. When the acknowledgement of the carrier is received, the complaint is transferred to the special reparation docket and given one of a series of consecutive numbers applicable to special reparation claims. Of such special reparation claims there were 4,675 during the fifteen months beginning with January 1, 1908. A consideration of the total number of complaints filed before the commission must take into consideration the fact that there is a considerable duplication arising from this transfer of informal complaints to the special reparation docket, one and the same complaint frequently being listed as an informal complaint and subsequently being listed as a special reparation claim.

In its annual report, however, the commission lists all of these complaints that are automatically adjusted under the title "Complaints in Which Reparation Was Authorized on Informal Pleading"; and in the case of various complaints specifies that the refund is made because of an "excessive rate." In that the rate has been applied through an admitted error, this designation is technically correct, but the rate is not excessive in the sense that the railway has been convicted of the filing and publishing of a rate that is unjust and unreasonable. A reader of the annual report not familiar with this distinction would easily gain the impression that the railways are guilty of a vastly greater number of cases of actual injustice than are fairly to be charged against them.

It became the custom of the commission when refund was ordered in a special reparation claim to decree that the rate made the basis of the refund should be kept in effect by the carrier for at least one year. For many reasons the railways objected to this "tying up" of rates, many of which they might desire to change within a shorter period. This is especially the case with a through rate made up in part of a rate specially reduced by an act of a state legislature or commission which the railways have contested, have taken to court, and which they expect to restore to a former basis in case a decision is rendered in their favor. To avoid this tying up of a rate, the railways adopted measures that led to the listing among the formal complaints of many of these special reparation claims that theretofore would have been adjusted informally, it being their contention that their admission that an erroneous rate had been applied prohibited the commission in a formal decision from ordering that the correct rate should remain in effect for a specific period. This contention is on the ground that the right of the commission in a formal decision to decree a rate in effect for a specific period is limited to its authority, under the Hepburn law, to make a rate effective for two years only in case a rate complained of has been found by it to be unjust and another rate prescribed by the commission substituted for it.

It therefore happens that the different reasons for which reparation is made on the special reparation docket appear also as the causes leading to reparation complaints that appear on the formal docket. These are indicated in table nine.

The cases in which the through rate charged has been in excess of the combination of local rates are almost without exception on sporadic shipments of miscellaneous merchandise not in channels of considerable traffic. They arise sometimes from the fact that the freight traffic department has not been thorough in adjusting its interstate tariffs to changes in intrastate rates; sometimes from the fact that the shipment is moved before it has really had time to make such adjustment. This is especially the case in the states of the Middle West, where intrastate reductions affecting interstate rates have been made in rapid succession by the different state legislatures and commissions.

In many cases where a shipment has been billed at a higher rate than applied via another route, the commission has allowed a railway to make reparation in order that its rate may be equalized with that of a competitor. It has announced, however, that after September 1, 1909, reparation on this ground will not be accorded, as it prevents the route having the lower rate from securing the natural advantage therefrom. It will be perceived that a prolific cause of these reparation

claims arises from the fact that a higher rate has been charged upon a shipment than the carrier immediately afterward places in effect and which it expresses a willingness to accept as the basis for the shipment already made. In nearly all cases these complaints are in regard to sporadic shipments. For example, from a point from which shipments of a particular commodity have been infrequent and inconsiderable, the class rate has been applied. All of a sudden, without notice or warning, a carload shipment is offered, upon which the railway is entirely willing to make a commodity rate, but it cannot do so without filing and publication thirty days in advance. This often happens in the rapidly developing portions of the country, where farms and factories increase their output at an entirely unexpected pace.

The cases where a rate has changed while a shipment is in transit require no comment. If the rate in effect at the time of receipt and that collected at destination be different from the rate in effect at the time of consignment there is obvious demand for adjustment.

Errors and inadvertent omissions in the tariffs sometimes arise from mistakes of the compilers of the tariffs and sometimes from undetected typographical errors.

Of all the causes specified in the preceding table, that designated as "error in the quotation of a rate" is the most deplorable. Happily the number of such errors is less than that arising from any other cause. When a station agent, face to face with a shipper, or over the telephone, or even in a written communication, quotes a specific rate and the shipment is made in the belief that that rate will apply, but it is subsequently ascertained that the filed and published rate is really higher, there is no recourse for the shipper but to pay the filed and published rate. This is bad enough in the case of a package or two upon which the difference may be only a few cents, or not more than a dollar or so, but if upon such a quotation a shipper should base the price quoted by him in a contract, involving a considerable transaction, the difference might absorb his profit or more than his profit. To make refund to him on the basis of the quoted rate would evidently open the door to rate-cutting without end. The commission, with entire justice, is emphatic in its condemnation of such errors.

Errors in the application of a rate arise, for example, from charging cross-ties at a higher rate than the lumber of which they are made; charging for stock cattle at the beef cattle rate, etc. In one case a carload billed as emigrants' movables was found to contain 565 pounds of cord wood, which the carrier charged at the cord wood rate. The commission held, however, that under the classification of household goods the tariff provision was so broad that this cord wood taken by the settler for his own use might be included as emigrants' movables.

Reparation because of misrouting by carrier usually arises from the fact that the carrier has not forwarded the shipment over the route specified by the shipper or, in the absence of specification, that it has sent the shipment over other than the cheapest and most direct route available. In the interior and western states, where there is a perplexing interlacing of different railways, the knowledge of what really is the cheapest and most direct route for a shipment to a remote place to which he has never before issued a bill of lading is often beyond the average freight agent, especially at a small station.

Complaints as to the erroneous interpretation of classification apply to such questions as whether articles intended for use in a particular machine or structure should be billed at the rate applying on the articles or that applying on the finished structures; as to whether show cases should be charged as store furniture or new furniture, and so on. One rather interesting case, indicating that the railway classification committees can be as technical as a governmental bureau, is that of a manufacturer of a brand of soap designated as "Pin Yon." The argument in this case contains the statement that the principal users of soap are the poor and illiterate classes, largely because the better to do send their laundry work out to washerwomen, who furnish the soap. Many of these washerwomen, especially of the thrifty colored sisters, can not read and do not know whether the grocer is giving them the kind of soap they want or not. This manufacturer hit upon the scheme of embedding a small piece of wire bent to resemble a safety-pin in the top of each cake of soap. Railway classifications provide that when a box of soap contains other articles as prizes the rate shall be 110 per cent. of the soap rate. Classifications also provide that when a shipment is constituted of two different articles, the entire shipment shall take the rate applying to the article of the higher class. In this case the safety-pin could not be considered as a prize. It really was only a label, no more a part of the soap than the tin tag on a plug of tobacco is a part of the tobacco. An inspector, however, brought the matter to the attention of the chairman of a classification committee, who held that the shipments should be charged at the safety-pin rate. As the difference more than absorbed the profit on the soap, the manufacturer naturally complained and the commission naturally ruled that the safety-pin was simply a trade-mark and should not subject the shipment to a charge higher than that which customarily applied on soap. Happily this is the only case in which the interpretation of the classification was not open to a reasonable doubt.

The demurrage complaints decided in favor of the complainants are of but little importance. The complaints asking reparation because of alleged errors in the application of the carload minimum largely hinge upon the points specified in the discussion of complaints as to incidental service, and the trifling importance of the complaints grouped as miscel-

TABLE IX.—*Reparation.*

	Territorial groups.										Totals.	Decision in favor of complainant reparation awarded.	Reparation not awarded complaint dismissed.	Complaint adjusted withdrawn or indefinitely postponed.	Not decided.
	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.					
Through rate charged in excess of combination of locals	..	6	9	2	4	19	..	12	5	1	58	34	4	7	13
Higher rate charged than in effect by another route	..	..	5	..	3	9	..	12	5	2	36	15	9	..	12
Class or other higher rate charged A commodity or other lower rate subsequently placed in effect	..	3	1	..	8	18	1	3	8	5	47	36	4	2	5
Rate changed, shipment in transit	..	..	..	1	..	..	..	3	1	..	5	3	..	1	1
Errors and inadvertent omissions in tariffs	1	1	5	..	1	7	..	3	2	1	21	18	..	2	1
Errors in quotation of rate	..	2	..	..	..	..	1	1	..	..	4	..	..	4	..
Error in application of rate	1	1	5	3	6	6	2	12	3	1	40	24	..	5	11
Misrouting of carrier	..	2	..	..	..	4	..	3	1	1	11	3	4	2	2
Erroneous interpretation of classification	..	1	..	..	..	2	..	..	..	7	10	6	2	..	2
Demurrage	1	3	..	..	2	..	..	2	..	..	8	3	3	..	2
Carload minimum	1	..	3	1	..	6	1	3	2	2	19	11	2	..	6
Miscellaneous	..	1	3	1	5	11	1	15	3	8	48	8	25	4	11
Totals	4	20	31	8	29	82	6	69	30	28	307	161	53	27	66

laneous is indicated by the fact that over half of them were dismissed or withdrawn.

Indeed, practically all of the complaints under the heading of reparation are inconsequential. They do not concern rates applying upon considerable shipments nor along the main lines of traffic.

This is a generalization that may fairly be applied to almost the entire list of formal complaints filed during the fifteen months under consideration. The exceptions are principally the complaints arising out of the rivalry between communities, such as that between the millers of the Northwest and the millers of Buffalo, the brewers of St. Louis and the brewers of Denver, the grain dealers of Milwaukee and the grain dealers of Chicago, between the manufacturers and merchants of Chicago and Cincinnati and their competitors on the north Atlantic seaboard for the trade of the Southeast, the merchants of Phoenix and Reno with their competitors at the Pacific coast terminals. Such complaints as these are all old grievances that for many years were the source of great perplexity to the freight traffic managers, but the burden has now been shifted to the shoulders of the Interstate Commerce Commission.

The difficulty that besets the railways when they endeavor to make an advance in their rates is indicated by the vigorous protests raised by the railway commission of Alabama and the railway commission of Texas.

The only reductions in rates of importance ordered by the commission were on natural ice from the lakes of New Jersey; on phosphate rock from Tennessee, and on fertilizer in various parts of the South.

Perhaps the principal service rendered by the Interstate Commerce Commission, that has been of benefit to both the shippers and the railways in the movement of freight traffic, has been the systematization of the tariffs, the insistence that they be uniform in size and arrangement and easily intelligible.

This summary of the work of the commission has taken account of no departments other than those concerned with the passing of judgment on complaints as to rates. The Bureau of Accounts and Statistics, the bureaus charged with the regulation of safety appliances, the recording of accidents, and matters pertaining to the new hours of service law, find no mention in this article. It would not be fair to conclude, however, without reference to the work of the division of prosecutions. The cases conducted by it to a conclusion during the fifteen months under consideration are summarized in the following table:

	Against railway.		Against shipper or passenger	
	Convicted and penalized.	Acquitted or dismissed.	Convicted and penalized.	Acquitted or dismissed.
Misbilling	..	..	6	1
Giving rebates	10	5	..	..
Receiving rebates	..	..	15	3
Unlawfully receiving less than tariff rates	1	..	..	..
Misuse of pass	..	..	5	1
Shipping high explosives on passenger cars	1	..	..	..
Failing to file schedules	1	..	..	..
Totals	13	5	26	5

In the Prussian House of Lords last May a member asked if a recent accident might not have been avoided if the train had been lighted by electricity. Railway Minister von Breitenbach replied that in this case the fire which burned the cars arose, not from the gas-lighted passenger cars, but from the electric-lighted mail car, immediately behind the engine, kindled, however, not by the lights, but by hot coals from the engine. Several years ago the Prussian State Railways appointed a commission to report on the dangers of lighting by gas. This commission reported that gas was preferable to electricity, and meanwhile lighting by gas has been much improved. The opinion of the experts of the State Railways is that car lighting by electricity is not yet perfected, and causes interruptions in traffic. The State Railways, however, have adopted electricity for sleeping cars, not because it is safer, but because there were many complaints that the gas lights overheated the upper parts of the cars.

HOW TO BE A FIRST CLASS TRAINMASTER.

FIRST PRIZE ARTICLE.

BY C. B. WILDMAN,

Trainmaster of the St. Louis, Iron Mountain & Southern, Van Buren, Ark.*

I believe the first duty of a trainmaster to be that of loyalty to his superior officers and to the company which employs him, for without such loyalty he cannot be successful. No matter how well qualified he may be for the position, regardless of his ability as a practical railway man, if in his heart there is not a feeling of absolute loyalty toward his company and his superior officers, he is short a valuable asset, that may eventually prove his downfall. With loyalty must be included truthfulness, not only from a moral standpoint, but from the fact that truth begets confidence, and once the trainmaster has lost or shaken the confidence of his employer, he is to be congratulated if he ever regains it.

As the superintendent is the head of the division, so the trainmaster is his right-hand man, often representing him. As such he should be careful of his personal appearance, bearing in mind that as the representative of the superintendent he would come in contact with the public in such a way that a good personal appearance might, and in all probability would, often result advantageously to the company. He should endeavor so far as possible to closely acquaint himself with the superintendent's ideas and methods of doing business, and as far as practicable conform to those methods.

The trainmaster should keep in close touch with affairs on his territory and should be careful to communicate to the superintendent all information that might prove to be of advantage or interest to him. In other words, he should keep the superintendent thoroughly posted on the *little things* as as well as the more important matters, as it is often the minor things that develop into the important ones. This can usually be accomplished by the trainmaster having access to the superintendent's office; but in case the superintendent is not easy to approach, or the trainmaster does not feel at liberty to speak freely and unreservedly, good results may be obtained by writing the superintendent a weekly letter, setting forth in a brief, concise manner the week's happenings. This should be a newsy letter, but care should be taken to make it as brief as consistent with the disclosures he has to make.

Next in importance is the handling of men. A trainmaster may have every other qualification necessary to his success, but if he lack tact or the ability to properly handle men, he is more or less of a failure. He must be able to inspire the confidence of his men and create among them the feeling of fidelity to the division officers and to the company's interests. On such a feeling depends the successful operation of his particular division. No division can make a creditable showing except by the combined efforts of the officials and the men.

The employing of men should have the trainmaster's personal attention. Care should be taken to employ only men of good habits and character, and of sufficient ability to fill the requirements of the position for which they are selected. He should personally inspect all applications for employment, satisfy himself that the applicant is of legal age, and cause such investigation to be made of his past record as will effectually establish his right to be employed or rejected. He should be

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kind and considerate, courteous and obliging, but always fair and firm, ever bearing in mind the differences in the mental and physical capacity of different men. He should always try to grant to a worthy employee any reasonable request if within his power to do so. He should study the character and the habits of his men and seek to become reasonably familiar with their manner of spending their time when not engaged in the service of the company. It does no harm for a trainmaster to occasionally inquire after the welfare of the employee's family. If it becomes necessary to reprimand an employee it should be done in a quiet, gentlemanly manner, and not in the presence of bystanders.

Here enters the question of enforcing the company's rules and the duty of the trainmaster in this respect. The rules of the railway company are largely for the guidance of the employees toward safe operation. These rules are carefully drafted by the management after a great deal of thought and consideration, each rule covering its own particular point. The trainmaster should carefully impress upon the minds of the employes the extreme importance of a strict observance of all rules. More than ordinary attention should be given to those rules which directly affect the safety of the public, the employees, and the company's property, but the violation of any rule, of whatever significance, should never pass unnoticed by the trainmaster. In other words, he should never turn his back or "wink" at a violation of a rule, no matter how insignificant its violation might seem to be. It is by far the better plan to use every precaution to prevent the violation of any rule rather than to suffer the less important rules to be violated indiscriminately, until an accident occurs, when some drastic action must be taken with the unfortunate employee, of whom an example must be made. One of the best methods of bringing and keeping the rules before the employee is to hold monthly or semi-monthly class meetings for the discussion of rules. It is an easy matter to convince the men that these meetings are not for the purpose of criticising their actions or opinions, but to bring about a clearer understanding of the rules and to impress upon them the importance of strict compliance with the same. It is the writer's experience that employees will speak freely and many good points will be brought out for the betterment of the service.

As a railway derives its principal revenue from the tonnage it hauls, it is of course incumbent upon the trainmaster to see that its tonnage or revenue is protected. He should carefully impress upon station agents and managers of industries the importance of loading cars to their capacity, and by frequent personal inspection satisfy himself that this is being done. With this result obtained, it is essential that each train have its full tonnage over the division. With the cars properly loaded and the train given its tonnage according to the capacity of the engine, there is little to be desired except a reasonably quick movement of the train over the division. In this connection the trainmaster should know, by making tonnage tests on the road, that each engine is being loaded to its capacity, and there should be no failure to handle the maximum tonnage at least one way over the district. He should never lose sight of the fact that heavy tonnage with the least possible mileage is necessary to successful operation. He should impress this feature upon the chief despatcher and the despatchers, and by frequent personal observation satisfy himself that the maximum tonnage is being handled.

The trainmaster should also keep in close touch with the engine mileage, that is the mileage of each engine, to see that a good average is made and the full use of each engine assured.

I believe it is as much the duty of the trainmaster as it is that of the superintendent to know at all times the number of net tons per train, as well as of the net tons per train mile, that is being handled over his territory. This information can be obtained either by estimating from operating sheets of previous periods, or by actual figures compiled from the wheel reports. Conductors may be requested to forward copy of wheel report to trainmaster's office, and from this report it is easy to arrive at the actual net tons per train and per train mile. With this information it is comparatively easy to arrive at a close estimate of the cost of operation, so that one does not need to wait for the operating sheet to know what kind of a showing the division has made. Here it may be well to mention a few of the advantages of being furnished with a copy of conductor's wheel report. These reports are especially valuable in tracing the movement of cars, obtaining seal records, etc., and reference to them will often avoid correspondence with conductors, thereby saving time. It also frequently occurs that the car accountant is short wheel reports from conductors for which he will wire the superintendent. Instead of consuming three or four days or a week, and perhaps burdening the wires with a number of telegrams, a copy can be made and forwarded by the trainmaster's clerk. If at first conductors object to making a carbon copy of this report, their objections will be quickly withdrawn when they see the advantages of reduced correspondence about wheel reports.

Among the various duties of the trainmaster, I believe none should stand out more clearly or receive closer attention than that of checking and watching overtime and constructive mileage. Constructive mileage, which to a degree is necessary, will increase to an alarming extent if it is not constantly checked. The trainmaster should satisfy himself as to the exact figure of his necessary or arbitrary constructive mileage and never let it go beyond that figure without knowing the cause of the increase. Dead-heading, which is a form of constructive time, should receive his particular attention. Too much stress cannot be laid upon the importance of watching and of checking overtime. Occasions may arise when overtime is found to be an extremely good investment, that is, for instance, when by paying a certain amount of overtime the company may obtain the equivalent of its value or perhaps avoid paying a greater amount, in mileage. On the other hand, unnecessary overtime means a waste of the company's money. It is so easy to pass beyond the dividing line between desirable and unnecessary overtime, that the constant and unflagging efforts of the trainmaster are required to prevent a leakage that may prove a burden to his company and result disastrously to himself. The writer has a statement prepared and left on his desk every morning of each hour's overtime made the previous day, and spends a few moments figuring the cost per mile and investigating such delays as may appear unnecessary. An accurate account or record is kept of the overtime for each day for comparison purposes. In this manner the trainmaster may know at all times just what his overtime is costing. This information is of such value to him that too much cannot be said of its benefits.

The distribution of cars is another important feature connected with the duties of the trainmaster. This is particularly true on territory where coal mines or large industries are located. The available empty cars must be properly prorated and distributed. Shippers should be urged to load cars with as little delay as possible, and it devolves upon the trainmaster to provide for the movement of such loaded cars promptly.

The trainmaster in passing over the road should make careful note of all foreign cars and take such steps as may be necessary to insure their prompt movement toward home, either loaded or empty, as conditions may warrant.

Especially important is the prompt release of cars under load. The trainmaster should urge upon station agents this particular feature and if necessary visit consignees in an effort to effect the prompt release of such cars. This is of more than ordinary importance during a temporary shortage of equipment or when the load is in a foreign car on which per diem is accruing. The release of cars under load with company material should receive his constant attention. He should personally and frequently check large yards, coal mines and

other obscure places, to see that empty cars are not lost sight of or loads unnecessarily delayed. Unbilled loads should be given special attention.

Not the least important of the trainmaster's duties is that of the economical equipment of cabooses. Here is the source of one of the common leakages on some of our most important railways. From personal experience it is known that by careful and constant attention the cost of such supplies can be greatly reduced and a large saving made for the company. In two years the cost of caboose supplies on one division was reduced from three mills to less than one mill per train mile. Train crews should be taught to carefully preserve all scrap or second-hand material with a view of exchanging it for new. Arrangements can be made for a credit to be allowed for second-hand material turned in and in that way effect a noticeable reduction in the cost of supplies. This practice also contributes to the keeping of such material cleaned up from along the track, which in itself is an advantage.

Another source of loss to a railway company is found in the manner of taking coal on engines from coal chutes. This loss is caused by enginemen calling for more coal than is needed and in some instances when none at all is required. As a result, the tender being unable to accommodate the amount of coal called for, some of it falls to the ground, and while this waste coal may later on be picked up and used, it has incurred an additional expense by reason of its being handled twice. It is a duty of the trainmaster to take such action as may be necessary to improve such a condition.

The trainmaster should frequently pass over his territory and personally visit station agents and should urge upon them the necessity of familiarizing themselves with the rules of the company and conforming to them. Agents should be required to keep their stations and surrounding grounds clean and when necessary keep the station properly heated and lighted. They should be reminded that the company requires them to be courteous and obliging in their intercourse with the public.

The trainmaster should check freight rooms frequently with a view of locating "astray" freight and to satisfy himself that there is no unclaimed perishable freight on hand. He should also insist upon agents keeping oil, oil cans, lamps, lanterns and other inflammables isolated so far as practicable, and that they allow no waste paper, rags, or other trash of an inflammable character to accumulate. This is a necessary precaution against fire. He should see that agents thoroughly understand the proper manner of handling explosives.

The trainmaster should familiarize himself with the methods employed by agents in checking and loading freight and in a general way with their system of reports.

The trainmaster should ride local freight trains frequently, instructing conductors as to the proper manner of handling freight, sealing cars, keeping seal records, and reporting "over," "short," or "damaged" freight. He should know that no unnecessary time is consumed in switching at stations and that all local work is properly performed.

The question of handling of time and perishable freight is also one that requires its share of the trainmaster's attention. The prompt switching into proper trains and forwarding of such freight to its destination is important; he should see that fast freight schedules are maintained when practicable; and in the event of any time or perishable freight being set out en route by reason of the car being in bad order or from other causes, that it is again forwarded at the first opportunity.

When the main track is obstructed or traffic interrupted by derailments, high water, wash-outs, burned bridges or other causes, the trainmaster should go to that point as quickly as possible and (in the absence of the superintendent) take full charge of opening the track. He should determine as soon as practicable the exact cause of the accident and advise his superior officers of the true conditions, giving full particulars as to the extent of damage to track, equipment, freight, etc., together with his estimate of the time required to open the track for traffic. He should see that there is no unnecessary loss of time in clearing or opening the track, and that the movement of traffic is resumed at the earliest possible moment. He should take steps to insure the protection of the company's property as well as that of any freight that may be involved. In the event of an injury to employees or passengers they should, of course, be given first consideration and it would devolve upon the trainmaster to see that everything possible was done to add to their comfort. Once the track is clear and the movement of traffic resumed, every attention should be given to the prompt clearing away of all debris, so that the track and right-of-way may at once assume its normal appearance.

The trainmaster should promptly and thoroughly investigate the cause of each accident, locate the responsibility if possible, and apply or recommend such discipline as may seem necessary.

It is a very good plan for a trainmaster to know just what the lost tonnage on account of engine failures is costing. This can be quickly figured by taking the total amount of tonnage lost, from which he can estimate the number of trains it would take to move that amount of tonnage, multiply the number of trains by the number of miles they would have to make (usually one freight district) which will give the train miles, this multiplied by the average transportation cost per mile, will give a close estimate in dollars and cents of what the engine failures cost the company. Engine failures should be investigated as to their cause, delay to trains, effect on tonnage, etc.

Passenger service should occupy not a little of the trainmaster's time and thought. He should bear in mind the daily intercourse between the passenger train employee and the traveling public and with that in view endeavor to select for his passenger train employees such men as seem best fitted for that service. The value of neatness and personal appearance should be impressed upon them and they should be shown the advantages the company will enjoy through their courteous manner and gentlemanly conduct.

Close attention should be given passenger coaches to see that they are clean, well ventilated and comfortable. Particularly should the trainmaster insist upon the strict observance of the rules by passenger train employees, for upon this largely depends the safety of the traveling public as well as the protection of company property. The attention of enginemen should be called to any rough handling of the train in stopping or starting and if necessary to the observance of speed restrictions through city limits. Special attention should be given to the importance of maintaining the schedules of passenger trains. Trainmen and enginemen as well as station agents should be instructed to take advantage of every move that would facilitate the handling of passengers, baggage and express, so that the delays incidental to the handling of such business could be reduced to the minimum.

On many railways there is at all times scattered along the track more or less scrap material. This feature should be watched closely by the trainmaster, and all concerned should be urged to use every effort to keep such material cleaned up or neatly piled at stations.

Bad order cars are a constant source of annoyance to the trainmaster. This is especially true of bad order cars under load. He should personally keep in touch with the bad order situation, see that all such cars under load are promptly repaired or the contents transferred, and keep the line clear of such cars, having the empty cars moved into regular repair points.

It is seldom a trainmaster's territory can show the best results year after year. Often adverse conditions will arise that may preclude the possibility of making the usual good showing. This may be caused by an unusual number of engine failures or by the power being in poor condition so that it can

not handle its full rating; perhaps a few washouts or a greater number of derailments than usual may have contributed to a congestion of loads. There may have been a large number of empty cars for movement from which no revenue tonnage was derived. These are conditions that any up-to-date trainmaster will strain a point to keep in touch with. He will in all probability keep some kind of a log book or memorandum to which he can easily and quickly refer, because the above-mentioned feature will bring about conditions that must sooner or later be explained, and if he has forgotten or has no log book he is put at a disadvantage. I believe a good record of the adverse operating conditions is as essential as some of the important records over which more time is spent.

Immediately preceding and during the periods of light business it is customary to reduce expenses so far as existing conditions will permit. While this feature is usually handled by the superintendent, it is in my opinion good form and excellent training for the trainmaster to assist him to the best of his ability. He should scrutinize the pay rolls often and carefully, inquiring into conditions at points where there is a possibility of reducing expense. The superintendent is usually glad to receive a suggestion that will enable him to accomplish this result.

The foregoing remarks, in my opinion, contain the most vital or important points involved in the duties of the trainmaster. These, added to the innumerable minor duties which are constantly claiming his attention, are calculated to make his life a busy one. He should be on the constant lookout for violations of rules, be quick to observe anything that might be out of line, and endeavor to conduct the business of the company with as much satsifaction to himself as if the property belonged to him. He must be prepared to devote his entire time to his company when necessary.

The conscientious trainmaster will at all times show a willingness to do all he can, and a desire to please his employers. With this in mind the knowledge of his duties will remain with him constantly, and notwithstanding any slight error in judgment he may from time to time exhibit, he will, I believe, have done his best to perform his full duty.

THE CORPORATION TAX.

Section 38 of the new tariff bill which has now become a law, deals with the corporation income tax and we print the full text. It provides:

That every corporation, joint stock company or association, organized for profit and having a capital stock represented by shares, and every insurance company, now or hereafter organized under the laws of the United States or of any state or territory of the United States or under the acts of Congress applicable to Alaska or the District of Columbia, or now or hereafter organized under the laws of any foreign country and engaged in business in any state or territory of the United States or in Alaska or in the District of Columbia, shall be subject to pay annually a special excise tax with respect to the carrying on or doing business by such corporation, joint stock company or association, or insurance company, equivalent to one per centum upon the entire net income over and above five thousand dollars received by it from all sources during such year, exclusive of amounts received by it as dividends upon stock of other corporations, joint stock companies or associations, or insurance companies, subject to the tax hereby imposed; or if organized under the laws of any foreign country, upon the amount of net income over and above five thousand dollars received by it from business transacted and capital invested within the United States and its territories, Alaska, and the District of Columbia during such year, exclusive of amounts so received by it as dividends upon stock of other corporations, joint stock companies or associations, or insurance companies, subject to the tax hereby imposed: Provided, however, That nothing in this section contained shall apply to labor, agricultural or horticultural organizations, or to fraternal beneficiary societies, orders, or associations operating under the lodge system, and providing for the payment of life, sick, accident and other benefits to the members of such societies, orders, or associations, and dependents of such members, nor to domestic building and loan associations, organized and operated exclusively for the mutual benefit of their members, nor to any corporation or association organized and operated exclusively for religious, charitable, or educational purposes, no part of the net income of which inures to the benefit of any private stockholder or individual.

Second—Such net income shall be ascertained by deducting from the gross amount of the income of such corporation, joint stock company or association, or insurance company, received within the year from all sources, (first) all the ordinary and necessary expenses actually paid within the year out of income in the maintenance and operation of its business and properties, including all charges such as rentals or franchise payments, required to be made as a condition to the continued use or possession of property; (second) all losses actually sustained within the year and not compensated by insurance or otherwise, including a reasonable allowance for depreciation of property, if any, and in the case of insurance companies the sums other than dividends, paid within the year on policy and annuity contracts and the net addition, if any, required by law to be made within the year to reserve funds; (third) interest actually paid within the year on its bonded or other indebtedness to an amount of such bonded and other indebtedness not exceeding the paid-up capital stock of such corporation, joint stock company or association, or insurance company, outstanding, at the close of the year, and in the case of a bank, banking association or trust company, all interest actually paid by it within the year on deposits; (fourth) all sums paid by it within the year for taxes imposed under the authority of the United States or of any state or territory thereof, or imposed by the government of any foreign country as a condition to carrying on business therein; (fifth) all amounts received by it within the year as dividends upon stock of other corporations, joint stock companies or associations, or insurance companies, subject to the tax hereby imposed: Provided, That in the case of a corporation, joint stock company or association, or insurance company, organized under the laws of a foreign country, such net income shall be ascertained by deducting from the gross amount of its income received within the year from business transacted and capital invested within the United States and any of its territories, Alaska and the District of Columbia; (first), all the ordinary and necessary expenses actually paid within the year out of earnings in the maintenance and operation of its business and property within the United States and its territories, Alaska and the District of Columbia, including all charges such as rentals or franchise payments required to be made as a condition to the continued use or possession of property; (second) all losses actually sustained within the year in business conducted by it within the United States or its territories, Alaska, or the District of Columbia not compensated by insurance or otherwise, including a reasonable allowance for depreciation of property, if any, and in the case of insurance companies the sums other than dividends, paid within the year on policy and annuity contracts and the net addition, if any, required by law to be made within the year to reserve funds; (third) interest actually paid within the year on its bonded or other indebtedness to an amount of such bonded and other indebtedness, not exceeding the proportion of its paid-up capital stock outstanding at the close of the year which the gross amount of its income for the year from business transacted and capital invested within the United States and any of its territories, Alaska, and the District of Columbia bears to the gross amount of its income derived from all sources within and without the United States; (fourth) the sums paid by it within the year for taxes im-

posed under the authority of the United States or of any state or territory thereof; (fifth) all amounts received by it within the year as dividends upon stock of other corporations, joint stock companies or associations and insurance companies, subject to the tax hereby imposed. In the case of assessment insurance companies the actual deposit of sums with state or territorial officers, pursuant to law, as additions to guaranty or reserve funds, shall be treated as being payments required by law to reserve funds.

Third—There shall be deducted from the amount of the net income of each of such corporations, joint stock companies or associations, or insurance companies, ascertained as provided in the foregoing paragraphs of this section, the sum of five thousand dollars, and said tax shall be computed upon the remainder of said net income of such corporation, joint stock company or association, or insurance company for the year ending December 31, 1909, and for each calendar year thereafter; and on or before the first day of March, 1910, and the first day of March in each year thereafter, a true and accurate return under oath or affirmation of its president, vice-president, or other principal officer, and its treasurer or assistant treasurer, shall be made by each of the corporations, joint stock companies or associations, and insurance companies, subject to the tax imposed by this section, to the collector of internal revenue for the district in which such corporation, joint stock company or association, or insurance company, has its principal place of business, or, in the case of a corporation, joint stock company or association, or insurance company, organized under the laws of a foreign country, in the place where its principal business is carried on within the United States, in such form as the commissioner of internal revenue, with the approval of the secretary of the treasury, shall prescribe, setting forth (first) the total amount of the paid-up capital stock of such corporation, joint stock company or association, or insurance company, outstanding at the close of the year; (second) the total amount of the bonded and other indebtedness of such corporation, joint stock company or association, or insurance company at the close of the year; (third) the gross amount of the income of such corporation, joint stock company or association, or insurance company, received during such year from all sources, and if organized under the laws of a foreign country the gross amount of its income received within the year from business transacted and capital invested within the United States and any of its territories, Alaska, and the District of Columbia; also the amount received by such corporation, joint stock company or association, or insurance company, within the year by way of dividends upon stock of other corporations, joint stock companies or associations, or insurance companies, subject to the tax imposed by this section; (fourth) the total amount of all the ordinary and necessary expenses actually paid out of earnings in the maintenance and operation of the business and properties of such corporation, joint stock company or association, or insurance company, within the year, stating separately all charges such as rentals or franchise payments required to be made as a condition to the continued use or possession of property, and if organized under the laws of a foreign country the amount so paid in the maintenance and operation of its business within the United States and its territories, Alaska, and the District of Columbia; (fifth) the total amount of all losses actually sustained during the year and not compensated by insurance or otherwise, stating separately any amounts allowed for depreciation of property, and in the case of insurance companies the sums other than dividends, paid within the year on policy and annuity contracts and the net addition, if any, required by law to be made within the year to reserve funds; and in the case of a corporation, joint stock company or association, or insurance company, organized under the laws of a foreign country, all losses actually sustained by it during the year in business conducted by it within the United States or its territories, Alaska, and the District of Columbia, not compensated by insurance or otherwise, stating separately any amounts allowed for depreciation of property, and in the case of insurance companies the sums other than dividends, paid within the year on policy and annuity contracts and the net addition, if any, required by law to be made within the year to reserve fund; (sixth) the amount of interest actually paid within the year on its bonded or other indebtedness to an amount of such bonded and other indebtedness not exceeding the paid-up capital stock of such corporation, joint stock company or association, or insurance company, outstanding at the close of the year, and in the case of a bank, banking association or trust company, stating separately all interest paid by it within the year on deposits; or in case of a corporation, joint stock company or association, or insurance company, organized under the laws of a foreign country, interest so paid on its bonded or other indebtedness to an amount of such bonded and other indebtedness not exceeding the proportion of its paid-up capital stock outstanding at the close of the year, which the gross amount of its income for the year from business transacted and capital invested within the United States and any of its territories, Alaska, and the District of Columbia, bears to the gross amount of its income derived from all sources within and without the United States; (seventh) the amount paid by it within the year for taxes imposed under the authority of the United States or any state or territory thereof, and separately the amount so paid by it for taxes imposed by the government of any foreign country as a condition to carrying on business therein; (eighth) the net income of such corporation, joint stock company or association, or insurance company after making the deductions in this section authorized. All such returns shall as received be transmitted forthwith by the collector to the commissioner of internal revenue.

Fourth—Whenever evidence shall be produced before the commissioner of internal revenue, which, in the opinion of the commissioner, justifies the belief that the return made by any corporation, joint stock company or association, or insurance company, is incorrect, or whenever any collector shall report to the commissioner of internal revenue that any corporation, joint stock company or association, or insurance company, has failed to make a return as required by law, the commissioner of internal revenue may require from the corporation, joint stock company or association, or insurance company making such return, such further information with reference to its capital, income, losses, and expenditures as he may deem expedient; and the commissioner of internal revenue, for the purpose of ascertaining the correctness of such returns or for the purpose of making a return where none has been made, is hereby authorized, by any regularly appointed revenue agent specially designated by him for that purpose, to examine any books and papers bearing upon the matters required to be included in the return of such corporation, joint stock company or association, or insurance company, and to require the attendance of any officer or employee of such corporation, joint stock company or association, or insurance company, and to take his testimony with reference to the matter required by law to be included in such return, with power to administer oaths to such person or persons; and the commissioner of internal revenue may also invoke the aid of any court of the United States having jurisdiction to require the attendance of such officers or employees and the production of such books and papers. Upon the information so acquired the commissioner of internal revenue may amend any return or make a return wnere none has been made. All proceedings taken by the commissioner of internal revenue under the provisions of this section shall be subject to the approval of the secretary of the treasury.

Fifth—All returns shall be retained by the commissioner of internal revenue, who shall make assessments thereon; and in case of any return made with false or fraudulent in-

tent, he shall add one hundred per centum of such tax, and in case of a refusal or neglect to make a return or to verify the same as aforesaid he shall add fifty per centum of such tax. In case of neglect occasioned by the sickness or absence of an officer of such corporation, joint stock company or association, or insurance company, required to make said return, or for other sufficient reason, the collector may allow such further time for making and delivering such return as he may deem necessary, not exceeding thirty days. The amount so added to the tax shall be collected at the same time and in the same manner as the tax originally assessed unless the refusal, neglect, or falsity is discovered after the date for payment of said taxes, in which case the amount so added shall be paid by the delinquent corporation, joint stock company or association, or insurance company, immediately upon notice given by the collector. All assessments shall be made and the several corporations, joint stock companies or associations, or insurance companies, shall be notified of the amount for which they are respectively liable on or before the first day of June of each successive year, and said assessments shall be paid on or before the thirtieth day of June, except in cases of refusal or neglect to make such return, and in cases of false or fraudulent returns, in which cases the commissioner of internal revenue shall, upon the discovery thereof, at any time within three years after said return is due, make a return upon information obtained as above provided for, and the assessment made by the commissioner of internal revenue thereon shall be paid by such corporation, joint stock company or association, or insurance company immediately upon notification of the amount of such assessment; and to any sum or sums due and unpaid after the thirtieth day of June in any year, and for ten days after notice and demand thereof by the collector, there shall be added the sum of five per centum on the amount of tax unpaid and interest at the rate of one per centum per month upon said tax from the time the same becomes due.

Sixth—When the assessment shall be made, as provided in this section, the returns, together with any corrections thereof which may have been made by the commissioner, shall be filed in the office of the commissioner of internal revenue and shall constitute public records and be open to inspection as such.

Seventh—It shall be unlawful for any collector, deputy collector, agent, clerk or other officer or employee of the United States to divulge or make known in any manner whatever not provided by law to any person any information obtained by him in the discharge of his official duty, or to divulge or make known in any manner not provided by law any document received, evidence taken, or report made under this section except upon the special direction of the President; and any offense against the foregoing provision shall be a misdemeanor and be punished by a fine not exceeding one thousand dollars, or by imprisonment not exceeding one year, or both, at the discretion of the court.

Eighth—If any of the corporations, joint stock companies or associations, or insurance companies, aforesaid, shall refuse or neglect to make a return at the time or times hereinbefore specified in each year, or shall render a false or fraudulent return, such corporation, joint stock company or association, or insurance company, shall be liable to a penalty of not less than one thousand dollars and not exceeding ten thousand dollars.

Any person authorized by law to make, render, sign, or verify any return, who makes any false or fraudulent return, or statement, with intent to defeat or evade the assessment required by this section to be made, shall be guilty of a misdemeanor, and shall be fined not exceeding one thousand dollars or to be imprisoned not exceeding one year, or both, at the discretion of the court, with the costs of prosecution.

All laws relating to the collection, remission and refund of internal revenue taxes, so far as applicable to and not inconsistent with the provisions of this section, are hereby extended and made applicable to the tax imposed by this section.

Jurisdiction is hereby conferred upon the circuit and district courts of the United States for the district within which any person summoned under this section to appear to testify or to produce books, as aforesaid, shall reside to compel such attendance, production of books, and testimony by appropriate process.

ACCIDENT BULLETIN NO. 31.

The Interstate Commerce Commission has issued Accident Bulletin, No. 31, showing railway accidents in the United States during January, February and March, 1909. The number of persons killed in train accidents was 177, and of injured 2,618. Accidents of other kinds, including those sustained by employees while at work and by passengers in getting on or off the cars, etc., bring the total number of casualties up to 15,785 (663 killed and 15,122 injured). These reports deal only with employees on duty and passengers. The reported casualties are classified in the following table:

TABLE NO. 1.—*Casualties to Persons.*

	Passengers		Employees		Tot'l persons reported	
	Kil'd.	Inj'd.	Kil'd.	Inj'd.	Kil'd.	Inj'd.
Collisions	31	704	70	557	101	1,261
Derailments	6	721	56	333	62	1,054
Miscellaneous train accidents	..	39	14	264	14	303
Total train accidents	37	1,464	140	1,154	177	2,618
Coupling or uncoupling	..	...	44	535	44	535
Other work abt trains or switches	..	...	24	3,502	24	3,502
In contact with bridges, etc.	..	2	17	240	17	242
Falling from cars or engines or while getting on or off	28	670	103	2,584	131	3,254
Other causes	15	609	255	4,362	270	4,971
Total other than train ac'd'ts.	43	1,281	443	11,223	486	12,504
Total, all classes	80	2,745	583	12,377	663	15,122

In Bulletin No. 27, one year ago, every important item showed marked decreases from the earlier records with which it was compared, the depression in business having continued six months. In some items the present record continues that favorable showing, though it covers a period in which considerable recovery of traffic had been accomplished. The comparisons are shown in the table next following. The present list of passengers killed in train accidents is swelled by one notable collision (Table No. 2*a*, No. 13).

TABLE NO. 1A.—*Comparison of Principal Items with Last Quarterly Bulletin and with One Year Back*

	Bulletins		
	No. 31.	No. 30.	No. 27.
1. Passengers killed in train accidents	37	34	21
2. Passengers killed, all causes	80	98	72
3. Employees killed in train accidents	140	150	104
4. Employees killed in coupling	44	44	44
5. Employees killed, all causes	583	700	656
6. Total passengers and employees killed	663	798	728

The collisions and derailments in the quarter now under review are set forth as follows:

TABLE NO. 2.—*Collisions and Derailments.*

	No.	Loss.	Persons Killed.	Persons Injured.
Collisions, rear	197	$191,111	16	347
" butting	125	260,205	54	426
" train separating	70	22,806	2	20
" miscellaneous	650	298,100	29	468
Total	1,042	$772,222	101	1,261
Derailments due to:				
Defects of roadway, etc.	260	$225,948	6	453
Defects of equipment	563	430,466	3	134
Negligence	82	48,007	6	75
Unforeseen obstruction	93	140,261	17	82
Malicious obstruction	11	45,254	12	74
Miscellaneous causes	233	185,044	18	236
Total	1,242	$1,074,980	62	1,054
Total collisions and derailments	2,284	$1,847,202	163	2,315
Total for same quarter of 1908	2,632	1,977,419	114	2,455
Total for same quarter of 1907	3,991	3,536,110	355	4,459

Following is the usual list of Class A train accidents—all in which the damage is reported at $10,000 or over, notable cases in which passengers are killed, and those doing damage

less than $10,000 and down to $2,000, wherever the circumstances or the cause may be of particular interest:

TABLE No. 2A.—*Causes of Twenty-nine Prominent Train Accidents.*

[NOTE.—R. stands for rear collision; B., butting collision; M., miscellaneous collisions; D., derailment; P., passenger train; F., freight and miscellaneous trains.]

No.	Class.	Kind of train.	Killed.	Injured.	Damage to engines, cars & roadway.	Reference to record.	Cause.
							Collisions.
1	B.	F. & F.	0	0	$1,394	54	Order delivered by despatcher at his own office to conductor gave wrong name of station in clause extending right of train and thus allowed train to encroach on right of opposing train.
2	B.	F. & F.	0	1	2,925	12	Empty engine ran past train order signal indicating stop. This was a new signal just put in service; old signal had not been taken down; engineman and fireman in charge of this train had been off duty 30 days and so were not acquainted with situation; but change of signals had been duly bulletined.
3	B.	F. & F.	0	1	3,500	46	Despatcher, in service of road eight months, gave order to inferior train before he had restricted superior. Had two years' experience elsewhere.
4	B.	F. & F.	2	1	4,106	50	Occurred 1 a.m.; operator gave clear signal when he should have stopped train for order which he held. It is believed that operator had been asleep and on awakening gave clear signal without due reflection.
5	B.	F. & F.	1	3	4,565	51	Engineman ran past meeting station; 3:40 a.m.; whole crew of train held blameworthy for not having been attentive to all conditions approaching stations. Engineman was asleep.
6	B.	P. & F.	0	46	5,200	5	Freight train, at meeting point, encroached on time of opposing freight, also of passenger train; passenger train also disregarded orders by approaching station not under control, passing station at 9:28, though it had been ordered to wait at that point for freight until 9:30.
7	B.	F. & F.	2	6	5,600	28	Operator 23 years old, in service at this point two weeks, though having had three years' experience elsewhere, made mistake in name of station in copying despatcher's telegraphic order. Believed that operator repeated the order to despatcher as copied and that despatcher failed to notice error.
8	B.	P. & P.	0	8	7,500	4	Engineman of westbound train forgot part of order telling him to take siding at meeting station and met eastbound train on main line.
9	B.	P. & F.	0	27	7,995	7	Engineman of passenger train, in reading schedule of opposing train, took the time against wrong station; conductor had trusted to his memory as to time, but a change of 10 minutes had been made in schedule in question, and conductor's memory proved defective.
10	B.	F. & F.	4	2	8,200	9	Conductor and engineman of the northbound train neglected to check register. (See note in text.)
11	M.	P. & F.	7	4	9,000	31	Occurred at 2:50 a.m.; engine standing on main track near station struck by approaching passenger train. Switch tender at entrance of yard had given clear signal to approaching passenger train wrongfully. Engineman and fireman of standing engine also held blameworthy for not having seen that they were properly protected. There was a fog at the time.
12	R.	F. & F.	0	4	12,200	53	Operator received order giving a train right over train 64, but the order which he delivered named train 84. It appears that operator did not deliver message which he had originally written, but made a new copy, and it was in making the new copy that error occurred.
13	B.	P. & F.	20	28	17,910	6	Westbound passenger train ordered to wait at "D" until 9:55, passed about 9:45, and collided with opposing train a short distance beyond station. Engineman's explanation is that he thought that the order gave him until 9:55 to reach the next station ahead; conductor did not take sufficiently prompt measures to stop train.
14	B.	P. & F.	1	14	21,250	47	Misreading of instructions and false clear block signal. (See note in text.)
15	R.	P. & P.	3	30	27,888	1	Engineman ran past distant and home automatic block signals; also disregarded torpedo warnings. (See note in text.)
		Total.....	40	175	$139,233		
							Derailments.
1	D.	P.	0	7	$2,000	66	Switch maliciously misplaced by man who desired to kill the fireman of train in question.
2	D.	P.	1	5	2,500	52	One passenger killed; cause undiscovered; speed, 18 miles an hour.
3	D.	P.	0	10	2,900	60	Tire of wheel of passenger car broken.
4	D.	F.	0	6	8,500	64	Runaway on steep grade, resulting in derailment at derailing switch at junction; air-brakes not skillfully managed.
5	D.	P.	1	7	9,500	40	Switch loose by reason of loss of bolt; believed that bolt was maliciously removed.
6	D.	P.	6	21	9,871	23	Misplaced switch due to broken switch lever; believed lever maliciously broken; derailed train struck employees' sleeping cars on side track, killing six employees.
7	D.	F.	0	0	10,110	43	Cause undiscovered.
8	D.	F.	0	0	10,730	19	Broken wheel flange; 100 ft. of bridge destroyed.
9	D.	P.	3	95	12,600	36	Three passengers killed; broken rail; weight of rail, 85 lbs. per yard; no flaw in rail; speed of train, 55 miles an hour.
10	D.	P.	1	84	13,000	17	Loose rail; track repairers at work on track had left rail insecurely spiked, yet did not signal train to reduce speed.
11	D.	F.	0	0	14,435	68	Runaway on steep grade of part of train (38 cars) which had been left without sufficient hand-brakes set; air had leaked off; train had broken in three parts in consequence of sudden and powerful application of air-brakes due to a leakage in train pipe; runaway cars were started by unskillful working in attempt to recouple the detached parts of the train.
12	D.	P.	1	37	17,300	39	Maliciously misplaced switch; speed, 45 miles an hour.
13	D.	P.	2	0	19,600	70	Landslide in cut 20 ft. deep, through conglomerate gravel; slope ¼ to 1; cut never gave trouble before; was inspected 12 hours previous to derailment, which occurred at 4 a.m.; four cars destroyed by fire, spread by escaping illuminating gas.
14	D.	F.	4	3	26,000	22	Enormous landslide; work train buried.
		Total.....	19	269	$159,046		
		Grand total.	59	444	$298,279		

Collision No. 15, causing the death of three persons, was due to disregard of automatic block signals and of torpedoes, which had been placed on the rails near the block signal and which gave audible warning. The collision occurred on a foggy night. The second section of a westbound passenger train, following the first section of the same train, ran into the rear of the first section while it was at rest (having been stopped at a signal station) and two Pullman cars were destroyed. Measuring back from the point of collision, the home block signal was 2,768 ft. distant, 550 ft. farther east were the torpedoes, and 2,661 ft. farther was the distant signal. The report says that the engineman heard the torpedoes. The fireman, as well as the engineman, is held blameworthy, the rule requiring enginemen and firemen to call one to the other on approaching fixed signals. The speed of the train appears not to have been slackened by the engineman at all. The experience of the engineman was twenty-seven years and of the fireman six years. The automatic signals had been

properly observed by the engineman of the first section of the train; also by the enginemen of other trains not long before.

Collision No. 14, a butting collision between a passenger train and a freight, causing the death of 1 trainman and the injury of 8 passengers and 6 trainmen, appears to have been due to gross negligence on the part, both of a station telegraph operator and of the men in charge of one of the trains. The manual block system was in effect, and the operator was at fault in giving the signals, while at the same time meeting orders had been issued by the train despatcher, which orders were disregarded by the conductor and engineman. The collision was between train 24 southbound, running from M to S and H, and a freight train northbound, running from H to S and M. The operator at S, after having authorized southbound train 24 to leave M, gave a clear signal for the northbound train to leave S for M, and the trains met about 4 miles north of S. The error of the conductor and engineman consisted in reading "No. 33" when the order actually read "No. 32."

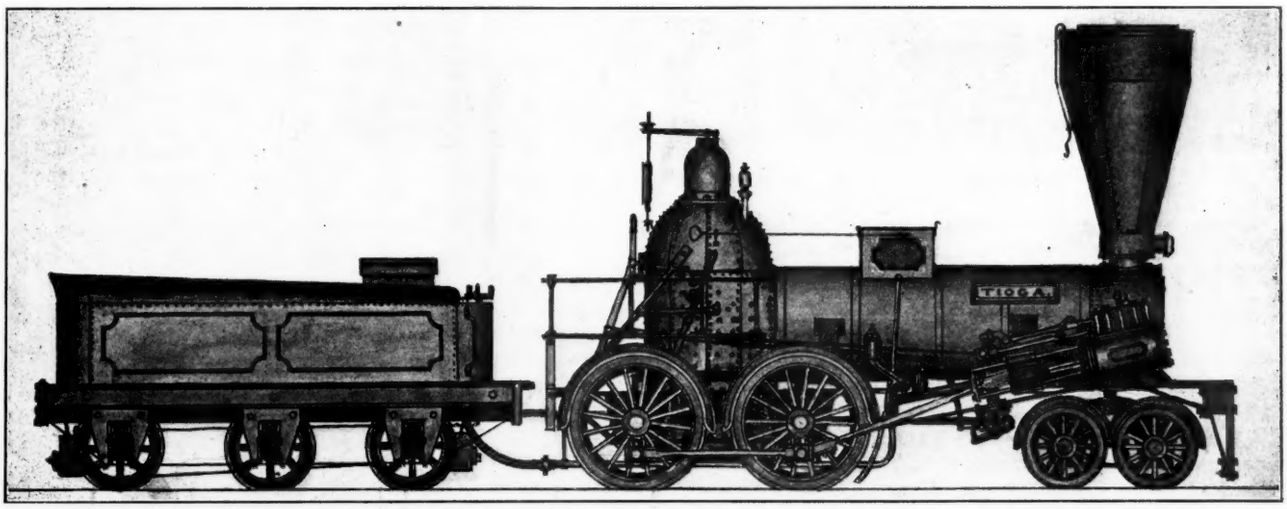
Collision No. 10 was between two extra freight trains, a northbound and a southbound. The order making the meeting point for these trains gave the number of the engine and the name of the conductor of each train, Conductor D for the northbound and Conductor S for the southbound; and the collision was due to the wrongful assumption by Conductor D of the northbound train that a southbound train which he met at the appointed meeting station was that of Conductor S, whereas, in fact, it was another train. This assumption by Conductor D was based on his knowledge that the engine which he saw was one which had been used by Conductor S earlier in the same day; but in thus assuming the conductor neglected his plain duty to learn the actual number of the engine in order to see that it corresponded with the number written in the meeting order. Conductor D then gave his engineman instructions to proceed. This was contrary to the rule, under which the conductor and engineman should have checked the register at the station, in which were recorded the arrivals of all trains. Both trains were running from 25 to 35 miles an hour at the moment of the collision. The conductor and engineman at fault both had been in the service of the company for many years.

THE NORRIS LOCOMOTIVE WORKS.

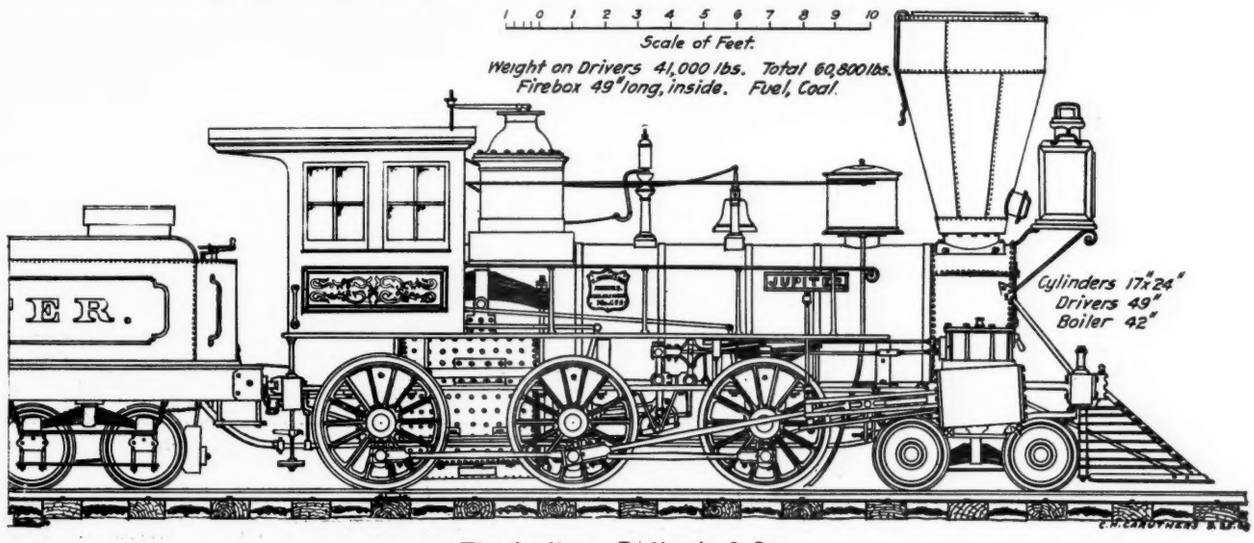
BY C. H. CARUTHERS.

II.

In 1848 a 4-4-0 engine, designated variously since as "Iowa," "No. 1," "Bob Ellis" and "No. 71," was built for the Milwaukee & Mississippi Railroad, and was the first engine to turn a wheel in Wisconsin. After a long service it came into possession of the Chicago, Milwaukee & St. Paul Railway Co., and was finally put out of commission about 1886. The boiler was then taken to Waukesha, Wis., and installed in the



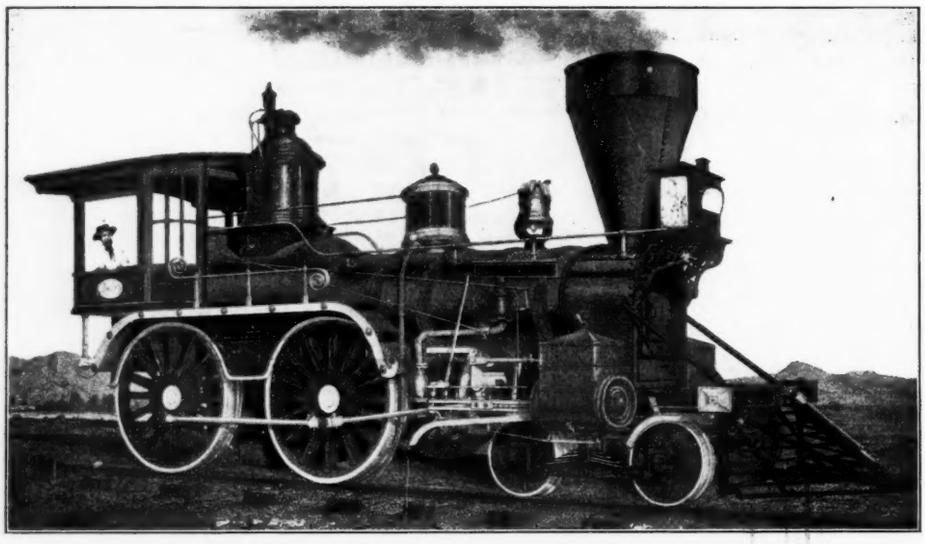
The Tioga. Built in 1848 by Norris Bros. for Philadelphia & Columbia Railroad.


1 0 1 2 3 4 5 6 7 8 9 10
Scale of Feet.
Weight on Drivers 41,000 lbs. Total 60,800 lbs.
Firebox 49" long, inside. Fuel, Coal.
E R.
JUPITER
Cylinders 17"x24"
Drivers 49"
Boiler 42"

The Jupiter. R. Norris & Son.

round-house of the company at that place, where it was still in service in May, 1898, at which time Mr. H. W. Grigg, master mechanic of the Prairie du Chien division of the road, furnished me with the following measurements taken from it, which give an idea of the boilers on the engines:

Diameter of smokebox	40	in.
" " barrel	36	"
" " dome (Bury)	45	"
" " flues	2	"
Length " "	122½	"
Number " "	108	"
Material " "	Copper	
Length of firebox, inside	39	in.
Width " " "	35½	"
Height " " "	48	"
Width of water spaces	2½	"
Length of boiler over all	204	"



The Sagua La Grande. R. Norris & Son, 1856.

Other dimensions of the engine were as follows:

Cylinders	14 in. x 26 in.
Diameter of driving wheels	54 "
Centers of driving wheels, apart	66 "
Total weight of engine	46,000 lbs.
Radius of hooks	69 in.
Rocker centers	Upper, 11 in.; lower, 9½ "
Spread of cylinders	72 "
Centers of valve rods, apart	57 "

The outer side of each pair of guides was elliptical in form and bore in its center, in letters of cast-iron, the inscription, "Norris Works." This is the only instance of such badge plate that has come under my notice in connection with drawings or photographs of Norris engines, or on the engines themselves.

Mr. Griggs has a photograph of this engine which shows its appearance shortly after it was taken from service on the road. While the smokestack, sandbox, cab, truck, tender and a few other parts are those of later years, much of the original engine, including the hook-motion, remains as when first built.

Although the photograph shows but a single valve in each steam chest, worked, of course, at full stroke only, it is probable that an independent half-stroke cut-off was used at first, as these cut-offs were often removed from such engines on a number of roads after the newer and larger machines had relegated them to work trains or yard work.

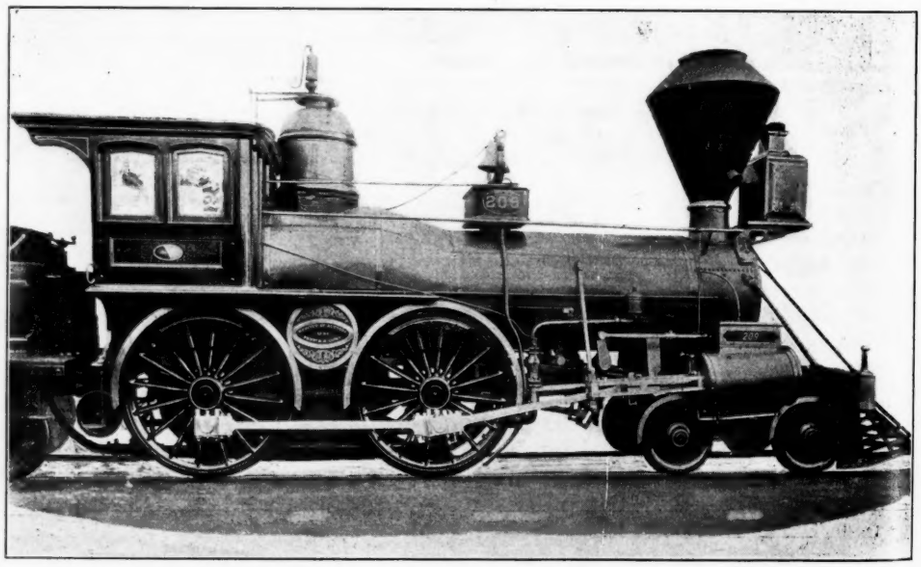
The "Lightning," a Crampton engine for the Utica & Schenectady Railroad, was also built in 1849 at the Schenectady plant of the company, previously mentioned.

The only record I have found of its service is contained in a rather vague statement that it "drew a train of eight-wheel cars at a speed of 72 miles per hour." Its valve-gear was of the stationary link type; its cylinders 16 in. x 22 in.; drivers, 84 in., and carrying wheels, 48 in. The latter were so arranged that a portion of the weight could be transferred to them from the drivers on the lighter grades and levels. The engine was handicapped by a small boiler and a lack of proportion between the driving wheels and cylinders, and was only retained in service for one year.

A 4-4-0 engine with 84-in. drivers was also built for the Erie in the same year, and its cylinders were placed immediately behind the smokebox.

In 1850 and 1851 quite a number of 4-4-0 engines were built for the two lines owned at that time by the Commonwealth of Pennsylvania. These were quite similar in general design to "Tioga," but were larger, and used eccentrics on the main driving axle to work the half-stroke, independent cut-off; instead of driving it from the crosshead.

"North Star" was also built in 1851 for the Utica & Syracuse Railroad, and, as will be seen by the accompanying illustration, differed widely from most of the Norris engines thus far considered, having horizontal cylinders, straight dome, Campbell firebox, alligator crossheads and two guidebars placed one over the other. The driving wheels appear to have been of a type that was used later in a number of engines by R. Norris & Son, but the wood filling is unique and did not appear in the later engines. An old engraving of the "North Star" from which my reproduction is made, bears the inscription, "with Septimus Norris' Variable Exhaust Valves." It is a pity that this engraving, like many

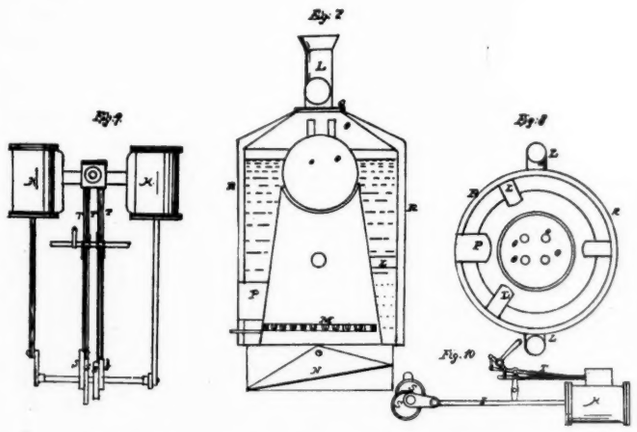


Pennsylvania Railroad Locomotive No. 209, Rebuilt at Altoona in 1864.

This engine originally was one of the four built by R. Norris & Son in 1854, for the Allegheny Portage Railroad division of the State Railroads of Pennsylvania, and was named W. T. Morrison. It was at that time a 4-6-0, with 18 x 24 in. cylinders, and 49 in. drivers, and weighed 59,500 lbs., of which 39,400 lbs. were on the drivers. In this rebuilt form, the original cylinders, boiler barrel and smokebox are retained. It is fitted with Gill & Co's smoke consumer.

of that period, is rather limited in detail, as the meaning of the inscription just quoted is not made clear upon it, nor is it easy to ascertain whether the valves were moved by hooks or links. The former is most probable, although but a single valve stem appears on the engraving. A good idea is afforded, however, of Norris' favorite method of arranging driving wheel springs. The wood lagging on the boiler, without an outside metallic covering, will also be noted.

The various features common to the "North Star" and the



Sections of the S. H. Long Locomotive; [Pat. Jan. 17, 1833.]

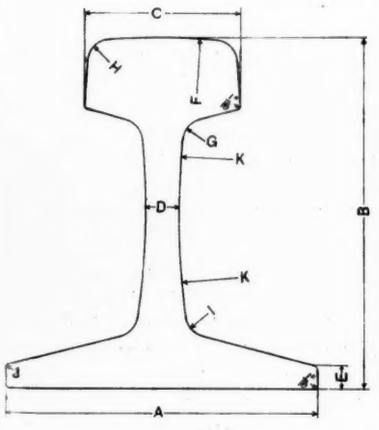
"Lightning" might favor a supposition that the first-named also used suspended links.

It will be noticed that the small escape pipe, the Campbell boiler, and the large dome set well forward on the boiler, are alike on both engines.

(To be continued.)

COMPARISON OF RECENT RAIL SECTIONS.

The table given herewith, comparing in detail the several prominent rail sections which have been brought out recently, was compiled by Robert W. Hunt & Co., Chicago. It includes the American Railway Association sections A and B, from 70 to 100 lbs., and the Canadian Pacific, the Santa Fe, the Pennsylvania, the Great Northern, the Canadian Northern and the Dudley (New York Central Lines) sections. Copies of the table may be obtained from the compilers at 1121 The Rookery, Chicago.



SECTION	WEIGHT	TYPE	A	B	C	D	E	F	G	H	I	J	K	SLOPE OF HEAD	SPLICE BAR ANGLE	% HEAD	% WEB	% BASE
ARA	100	A	5 32/64	6	2 48/64	36/64	24/64	14	6/16	6/16	6/16	1/16	14	1/16 TO 1	4 TO 1	36.9	23.4	39.7
"	"	B	5 9/64	5 41/64	2 42/64	36/64	31/64	12	5/16	6/16	5/16	1/16	12	3°	13°	40.2	19.2	40.6
"	90	A	5 8/64	5 40/64	2 36/64	36/64	24/64	14	6/16	6/16	6/16	1/16	14	1/16 TO 1	4 TO 1	36.2	24.0	39.8
"	"	B	4 49/64	5 17/64	2 36/64	36/64	31/64	12	5/16	6/16	5/16	1/16	12	3°	13°	40.1	19.2	40.7
"	80	A	4 40/64	5 8/64	2 32/64	33/64	24/64	14	6/16	6/16	6/16	1/16	14	1/16 TO 1	4 TO 1	38.8	21.0	40.2
"	"	B	4 28/64	4 60/64	2 28/64	35/64	31/64	12	5/16	6/16	5/16	1/16	12	3°	13°	38.8	19.5	41.7
"	70	A	4 16/64	4 48/64	2 24/64	32/64	24/64	14	6/16	6/16	6/16	1/16	14	1/16 TO 1	4 TO 1	39.3	21.8	38.9
"	"	B	4 3/64	4 35/64	2 24/64	33/64	29/64	12	5/16	6/16	5/16	1/16	12	3°	13°	40.1	19.5	40.4
CANADIAN PACIFIC	85		5	5 8/64	2 32/64	36/64	24/64	8	6/16	4/16	6/16	4/16	8	2 7/16 AT TOP	4 TO 1	36.7	22.2	41.0
SANTA FE	85		4 56/64	5 24/64	2 32/64	36/64		14	6/16	6/16	6/16	1/16	14	1 TO 16	4 TO 1	37.0	22.7	40.2
PENN	100		5	5 44/64	2 43/64	36/64	34/64	10	5/16	7/16	5/16	1/16	10	2 1/2 AT TOP	15° TOP 13° BASE	41.0	18.6	40.4
"	85		4 40/64	5 8/64	2 32/64	34/64	30/64	10	4/16	7/16	4/16	1/16	10	0	15° TOP 13° BASE	42.2	17.8	40.0
GREAT NORTHERN	90		5	5 24/64	2 40/64	40/64		14	6/16	10/16	6/16	1/16	14	5°	13°	36.6	23.3	40.1
CANADIAN NORTHERN	80		5	5	2 36/64	35/64	21/64	8	6/16	4/16	6/16	4/16	8	2 1/2 AT TOP	13°	39.2	21.3	39.5
DUDLEY	100		5 32/64	6	3	38/64		14	6/16	5/16	5/16	1/16	14	1 TO 16	4 TO 1	41.2	24.2	34.5
"	85		5	5 16/64	2 44/64	34/64		14	8/16	5/16	5/16	1/16	14	1 TO 16	4 TO 1	45.4	21.0	33.5

Comparison of Recent Rail Sections.

COMPETITION OF STEAM AND ELECTRIC ROADS FOR LOCAL PASSENGER BUSINESS.

BY SAMUEL O. DUNN.
Western Editorial Manager, *Railroad Age Gazette.*

Many officers of steam railways are devising means for meeting and forestalling the competition of electric lines for local passenger business. Some of the eastern roads, such as the New York, New Haven & Hartford, have endeavored to solve the problem by getting control of the competing electric roads, as well as by electrifying sections and divisions. Others, such as the Erie and the New York Central on its main line and the West Shore, have electrified divisions or parts of divisions.

While these developments have been taking place in the east the mileage of electric interurban lines in the territory west of Pittsburgh and Buffalo, north of the Ohio river and east of the Missouri river has been increasing with great rapidity. Hundreds of miles of steam roads have been closely paralleled. Meantime, the steam roads in this territory have electrified few parts of their own lines and have done little in getting control. In some cases they have entered into working arrangements with the electric roads that are not regarded as direct competitors, but as more properly feeders. The Illinois Central, for example, has leased one track of its new Kensington & Eastern line to the Chicago, Lake Shore & South Bend, an electric road. The Rock Island-Frisco system has entered into an arrangement with the electric Illinois Traction System for the interchange of freight.

It is generally considered that a parallel electric line at once creates new local passenger business, and also usually takes about 75 per cent. of the steam road's local passenger business at stations where they compete. Of course, the percentage varies considerably under different conditions. It depends not only on the frequency and convenience of the electric line's service, but also on that of the steam road.

By "local business' is meant hauls of 50 miles or less. For distances of 25 miles or more the competition of the electric roads is not very effective, and for distances of 50 miles or more the experience has been, thus far, that its effectiveness declines rapidly.

THE GRADING OF ELECTRIC COMPETITION.

Some interesting figures may be given showing how the effectiveness of electric competition grows less as the length of hauls increases. For example, a steam road in one month in 1908 hauled 922 passengers between two points 9 miles apart, receiving from them a revenue of $177. During the same

month of 1909 its local business at the same points was reduced by electric competition to 274 passengers and its revenue to $38, the reduction of passengers being 70 per cent. and of revenue almost 80 per cent. Between two other points 9 miles apart the number of passengers carried in one month in 1908 before electric competition was 562 and the revenue $112. In the same month of 1909 the number of passengers was reduced by electric competition to 125, or 78 per cent., and the revenue to $27, or 76 per cent. Between two points 17 miles apart the reduction caused by electric competition was from 636 passengers in a month of 1908 to 188 passengers in 1909, or 70 per cent., and the reduction in local earnings was from $254 to $75, or 70 per cent. Between two points 21 miles apart the number of passengers carried in a month in 1908 was 800 and the revenue $449; and in the same month of 1909 the number of passengers carried was 500 and the revenue $234. Here the reduction in passengers was 37 per cent. and the reduction in earnings 50 per cent. Between two points 27 miles apart the reduction caused by electric competition was from 10,895 passengers in a month of 1908 to 886 passengers in the same month of 1909, or 90 per cent., and of earnings from $4,110 to $425, or 90 per cent. Here the electric service was especially good. Between two points 31 miles apart electric competition caused the following differences in figures between corresponding months of 1908 and 1909: 1908, passengers carried, 1,200; revenue, $676; 1909, passengers carried, 700; revenue, $360, the reductions in passengers carried and revenue being each about 50 per cent. The local business of a road between two large places 58 miles apart in March, 1908, was: Passengers, 22,843; revenue, $10,976. Electric competition reduced it in March, 1909, to: Passengers, 12,975; revenue, $7,710; reduction in passengers, 43 per cent.; reduction in earnings, 30 per cent. These figures relate not only to passengers traveling the whole distance in each case, but also to traffic between intermediate points. Unless this fact were borne in mind, it might be inferred that the effectiveness of electric competition declines with increasing distance less rapidly than it actually does.

Usually the discomforts of a long ride on a "through" interurban route are great. Cars usually are run singly, and the frequent stops are tiresome. Usually, also, the seats in even the best interurban cars are close together and uncomfortable for long distances. But this does not repel local business. The convenience of the service makes the passenger quite willing to tolerate discomforts that are not seriously felt on a short ride. But when the passenger is going on a longer trip he usually is willing to walk a little farther or wait a little longer for a train that can carry him in more comfort.

DEVELOPMENT OF INTERURBAN LINES IN CENTRAL TERRITORY.

Outside of New England the greatest development of electric lines, both extensive and intensive, has been in Ohio and Indiana. Within recent years there has been a good deal of development in Illinois and southern Wisconsin. A considerable mileage is also being built in Missouri, Iowa, eastern Kansas and eastern Nebraska. As the first aim of their projectors always has been to get a maximum amount of local passenger business at the start, and as the densest population has clustered along the steam roads, the electric lines usually have been built directly parallel to the most prosperous steam railways. The most prominent example, perhaps, is the Illinois Traction System's lines, which include almost 500 miles. These directly parallel parts of the lines of the Wabash, the Chicago & Alton, the Illinois Central and the Big Four from points in central Illinois to East St. Louis. This system expects to gain entrance to St. Louis over its own bridge across the Mississippi river by next January. Needless to say, it has taken much local passenger business from the competing steam roads. It is now running 15 through cars daily between Springfield, Ill., and St. Louis. If the steam roads do not provide additional local transportation facilities, the construction of new interurban lines will go on until most other parts of the country are covered, as in New England, Ohio, Indiana and parts of Illinois and Wisconsin are now.

ELECTRIC LINES' EARNINGS IN HARD TIMES.

During the year immediately following the panic of 1907 the steam railways of the country suffered losses of gross earnings aggregating about $300,000,000, mostly on freight traffic. When hard times come production decreases and thousands of people earn less; but there is no proportionate decline in passenger business. As might be anticipated, therefore, the interurban roads, which in the main are exclusively passenger roads, suffered nothing like such heavy losses of earnings during the first year of the depression as did the steam roads. Some electric lines which connect manufacturing centers and carry workmen to and from their work had heavy declines in earnings, but the number of these lines was relatively small. The *Commercial and Financial Chronicle* has printed comparative figures of gross and net earnings for 203 electric roads during the calendar years of 1907 and 1908. These showed aggregate gross earnings in 1908 of $280,262,681, as compared with 278,387,557 in 1907, and aggregate net earnings of $117,441,782 in 1908, as compared with $114,406,399 in 1907. The increases are small, of course, but the significant thing is that there should have been any at all. Twenty-nine other electric roads furnished figures of gross, but not of net earnings. These raised the total gross to $325,409,963 in 1908, as compared with $321,712,120 in 1907. Of course, a large proportion of the lines included are street railways; but the detailed figures show that the strictly interurban lines suffered far less than the steam roads. Obviously, the financial position of the steam roads would be substantially strengthened if they, instead of the electric lines, were handling this large local passenger business.

EFFORTS TO MEET ELECTRIC COMPETITION.

The officers of the steam railways have been alive to the situation. In some cases they have put on "dummy" trains, giving frequent service. In many instances they have sold round-trip tickets nearly or quite as low as the electric fares. One of the roads which has met pretty severe competition from electric lines is the Toledo, St. Louis & Western. It has sought to hold its local passenger business by selling "twin tickets" and increasing its local steam train service. It had the usual experience of losing 50 to 75 per cent. of its local business where it met electric competition, but at many places it has succeeded in reducing its losses to about 40 per cent. Some specific instances regarding its experience at points where it competes with electric lines may be of interest. At Bluffton, Ind., in October, 1907, it sold 99 tickets and in October, 1908, 105 tickets. At Liberty Center, Ind., it sold 7 tickets in October, 1907, and 20 in October, 1908. At Landis, Ind., it sold 16 tickets in October, 1907, and 20 in the same month of 1908. At Marion, Ind., it lost ground, selling 289 tickets in October, 1907, and 147 in the same month of 1908. At Bluffton it sold 70 tickets in December, 1907, and 110 in the same month of 1908. At Warren, Ind., 62 tickets were sold in 1908, as compared with 37 in the same month of the preceding year. These figures, of course, are for small places and are given merely to show that increased local steam service and low round-trip rates will often help to recoup losses due to electric competition, although they seldom will bring back more than half of the lost traffic.

COMPETITION ONE OF SERVICE, RATHER THAN OF RATES.

When electric lines first began to attract local passenger business from steam roads their success in competition was attributed by many to the fact that their charges were lower, but the fact is coming to be clearly recognized that the competition is one of service rather than of rates. The managers of electric lines could have saved themselves some money if they had recognized this fact years ago.

There are three points in which the electric lines have dis-

tinct advantages over the steam roads. First, electric traction is more cleanly. Second, as cars can be run singly instead of in trains the service, when there is enough business, is so divisible without loss and is made much more frequent. Third, the electric interurban cars usually run to the hearts of cities and towns and can be boarded at a hundred convenient places where the steam road is confined to a single station. These disadvantages can only be partially overcome by the regulation train of engine and cars, and so the motor car has come into use.

DEVELOPMENT OF MOTOR CARS.

A pioneer in the development of motor cars for passenger service was C. Peter Clark, now second vice-president and general manager of the Buffalo & Susquehanna. About 12 years ago, when he was general manager of the New England Railroad, he had a motor car built by the Schenectady Locomotive Works. The same works, a short time afterwards, built a similar car for the Erie, and the Baldwin Locomotive Works built two steam motor cars, one being for the Cincinnati, Hamilton & Dayton. The American Locomotive Company has built steam motor cars for the Chicago, Rock Island & Pacific and the Delaware, Lackawanna & Western. H. H. Vaughan, of the Canadian Pacific, built a steam motor car about three years ago from his own designs. The Fairbanks-Morse Company makes a gasolene motor passenger car with room for 19 people, and another for 35. G. R. Joughins, superintendent of motive power of the Intercolonial of Canada, built a similar car for that road. The Stover Motor Car Company has made a number of gasolene cars which are being used successfully on several railways; one is now being tried on the Rock Island; others are in service on the Wisconsin & Michigan, the Tennessee & Cumberland River, and other small roads. The Ganz people have built a number of steam motor cars that have been tried successfully on various railways in this country. The General Electric Company has built several gasolene electric motor cars, an early one being for the Delaware & Hudson. The Strang gasolene car has been tried on a number of roads. F. M. Hicks built a number of gasolene-electric motor cars for the St. Joseph Valley Traction Company. Eighteen railways in the United States are now either using or have ordered gasolene cars built by the McKeen Motor Car Company. The McKeen car is in more extensive use than any other motor car. Twenty of them are in service on the Union Pacific. Other roads using them include the San Diego, Cuyamaca & Eastern, Illinois Central, Southern Pacific, Galveston, Harrisburg & San Antonio, Erie, Chicago & North-Western, Los Angeles & San Diego Beach, Silver Peak, Santa Fe, Bellingham Bay & British Columbia, Northern Pacific and the St. Joseph & Grand Island.

SOME RESULTS OF MOTOR CAR SERVICE.

For a long time motor cars got out of repair so often that they were unreliable, but their service is cheap and good and the development toward reliability is rapid. The McKeen cars, for example, are making daily or twice daily trips of from 52 to 197 miles a day on the Union Pacific. The speed of the cars over an 80-ft. grade is from 25 to 35 miles an hour. A Strang car, about three years ago, made a successsful run from New York to Kansas City. A McKeen car has made a continuous run from Omaha to Denver, 569 miles, in 16 hours and 33 minutes. Deducting time lost by stops for orders, etc., the car averaged 44 miles an hour for the entire run. A new McKeen car just out of the shop made a run from Omaha to Los Angeles, 1,818 miles, in four days, including a delay of 15 hours at Ogden. A 100-h.p. car of this type, making daily round trips and handling a trailer, maintained continuous service for nine months without a failure. The 200-h.p. cars in daily interurban service on the Union Pacific in Colorado are maintaining an average schedule of 22 to 30 miles an hour, including frequent stops. Both the 100 and the 200-h.p. motor cars on this road maintained regular road service during three successive winters, bucking deep snow drifts and encountering high winds and snows without serious complications. During the month of August, 1908, when motor cars on the Union Pacific made 518 trips, schedule time or better was made on 507 trips, and the 11 imperfect records were not seriously bad. In August, 1908, six of these cars coupled up as a train ran from Omaha to Sacramento in seven days under their own power. They ran in day time only, being tied up at night. The weight of the McKeen cars per passenger carried has been reduced to 800 lbs. when all seats are filled and to 500 lbs. with standing room occupied.

The foregoing data was furnished by the maker of the cars and by officers of the Union Pacific. The Union Pacific does not make public the earnings of the cars, but officers say that their operation has been "entirely satisfactory from the passenger traffic standpoint."

The St. Joseph & Grand Island is making interesting use of McKeen motor cars. About July 1, 1909, suburban motor car service was inaugurated by this road between Highland, Kan., and St. Joseph. Highland is a university town about 29 miles from St. Joseph, and until the Grand Island built a spur from Stout, Kan., north to Highland, seven miles distant, the nearest railway station was one on the Burlington, which was four miles away. Since its inauguration the motor car service between St. Joseph and Highland has averaged 75 passengers to the car, and the car, which is 55 ft. long, seats only 58 persons. Much of the traffic is new business. In addition to the stations there are four other stopping places within 15 miles of St. Joseph. The cars run the 29 miles between Highland and St. Joseph in 1 hour and 25 minutes. The service has proved so satisfactory from the road's standpoint that orders have been given for three more McKeen cars, each 70 ft. long and seating 90 passengers. One of the new cars will be put in service between Seneca, Kan., and St. Joseph; one between Fairbury, Neb., and Grand Island, Neb., and another between St. Joseph and Kansas City. All this service is additional to that provided by regular passenger trains.

The Chicago & Alton recently used a Strang Car in local passenger traffic in and out of Bloomington. No specific traffic results have been made public, but it is understood that they were not unsatisfactory. The Rock Island has used on its branch between Herington and Salina, Kan., a distance of 49 miles, the oil-burning motor car built for it by the American Locomotive Company. A statement of the comparative cost of this service and the service of a steam train was published in the *Railroad Age Gazette*, March 26 last.

SERVICE TO WHICH MOTOR CARS ARE ADAPTED.

The passenger service to which motor cars are adapted may be divided roughly into three classes. They may be used upon branch lines where the traffic is so light that the operation of a steam train is unprofitable. A committee of the Master Mechanics' Association estimated in 1906 that on the hypothesis of the same density of traffic and the same class of service as would be met on an ordinary branch line in the territory west of the Missouri river, the cost per train-mile for local steam trains, consisting of two cars and a locomotive, would be about 24 cents, including repairs, fuel, oil, labor, cleaning, etc. This is for passenger as well as baggage, mail and express service. With gasolene motor car service (mechanical drive only considered) consisting of one car and a trailer, with baggage, mail and express service, it was estimated—similar expenses being included—that the cost would be 15 cents a mile. The average cost per mile of the Rock Island car built by the American Locomotive Company was higher than this, while the average cost of the steam train was lower. In November, 1908, when the car ran 20 days, the average cost was 15.13 cents per mile, while the average cost per mile of the steam train, consisting of a locomotive and two cars, during 26 days in January, 1909, was 17.31 cents per mile. The average cost per mile of the motor car during the other 27

days it was in service was higher. But it was used under hard conditions, and it is believed it will make a better showing elsewhere. There seems no reason to doubt that under ordinary conditions a motor car can be operated more cheaply than a steam train on a branch line, the direct cost being 14 to 15 cents a mile.

The second class of service in which the motor car may be profitably used is on steam lines of heavy traffic which compete for local passenger business with electric lines; and the third is where the local passenger traffic of the steam road and the density of population are such that electric competition is apt to develop unless the steam road makes provision for more satisfactory handling of both the existing and potential local business.

Most of the motor cars now in use on steam roads have been used for the first-mentioned purpose, that of supplying a cheaper form of transportation than the steam train on branches where passenger traffic is so light that regular steam service is unprofitable. There seems to be no question that in numerous cases motor cars have served, and in many other cases can be made to serve, this purpose. Probably in many cases they can be made to provide a local service that will forestall electric competition.

In the report to the Master Mechanics' Association already referred to, the committee estimated the cost of electric service—equipment consisting of one car and a trailer, and the density of traffic being assumed to be great enough to support the service seven days a week—at 18 cents a mile. This is about 3 cents a mile higher than the cost estimated in the same report—an estimate amply borne out by experience—of gasolene service, equipment consisting of one car and a trailer, and handling passengers, baggage, mail and express. Of course, where the density of traffic is great electric service is much cheaper, being as low as 9 or 10 cents a car-mile. It seems evident that at many places where the local passenger traffic would make a frequent electric service profitable it also would make profitable an equally frequent motor car service, provided that the tracks on which the motor cars ran should be so located as to enable the cars to go where they would be as convenient as electric cars for passengers to reach.

IMPORTANCE OF ACCESSIBILITY OF CARS.

The accessibility of cars is as important a factor as frequency of service, but those of the older steam roads whose lines run through the middle of towns and cities could at many places put on a frequent motor car service that would meet or prevent electric competition. Where a steam road reaches only the outskirts of a town it must in some way get its cars where they will be convenient to board. Where the ground is not already occupied by an electric line it is often possible to get motor car tracks in the streets. Where there is urban, but not interurban electric service, it is feasible in some cases for steam roads to get the right to run interurban motor cars over the electric line's tracks. It seems clear that where the population is dense and the existing or possible local traffic is heavy the complete way to forestall or meet electric competition is to electrify suburban divisions and to reach the business parts of towns and cities just as the electric interurban lines do.

THE ECONOMIC WASTE OF INDEPENDENT ELECTRIC CONSTRUCTION.

The construction of electric railways which closely parallel steam roads has involved an immense economic waste. Suppose that the electric line costs only $30,000 a mile. The steam road which it parallels could have been electrified so as to render similar service and earn an equal amount of money for perhaps half cost; the other half has been spent with no benefit to the public. Many electric interurban lines do not parallel steam roads, and are really feeders to them rather than competitors.

SUBORDINATION BY STEAM ROADS OF LOCAL TO THROUGH BUSINESS.

The failure of the steam railway corporations to themselves provide, in one way or another, where possible, the frequent and convenient local passenger service which the electric interurban roads afford, has been a serious mistake. It has been too much the practice to subordinate local passenger traffic to through passenger traffic. Nobody foresaw, however, or could have clearly foreseen, what the electric lines have done. Their projectors did not foresee it. One of the main errors of the steam road managements has been that they have counted too much the cost of rendering additional local service and not enough the additional traffic that the more frequent and convenient service would create. This has not been true of all. In some cases the managements of steam roads in populous territory, instructed by the experience of the electric lines, recently have put on more frequent local steam train service, both where there is and where there is not electric competition; and, where they have continued this service long enough, they have found that the additional trains did not have to divide the existing light local traffic with the trains previously in service, but that the earnings of the older trains were not unfavorably affected, while the earnings of the newer trains grew. In some cases where motor cars have been used they have developed so much of local business that it has been found profitable to supplant them with steam trains.

FORESTALLING ELECTRIC COMPETITION.

The obstacles that the New Haven has met in absorbing competing electric lines indicate what other steam roads may expect if they try to get control of electric roads in their respective territories. It is one of the curious features of our public policy that public officials, courts and public sentiment heartily encourage a one-track road to build a parallel second, third or fourth track, but oppose the buying of parallel tracks.

The problem to be solved by steam roads where electric competition has not appeared seems much simpler. Experience has many times demonstrated in well-settled communities that by suitable service a local passenger traffic may be developed which will yield substantial profits. The steam road, already having the organization and the most costly of the facilities necessary for this business, can develop and handle it at less expense and with more profit than can an independent company.

In many cases, where the steam roads run directly through the towns along their lines, electrification unquestionably would have prevented the building of competing lines. In other cases the old companies might be able, as already intimated, to forestall competition by running cars over lines in the street. But it undoubtedly is true that in many instances electrification would not have forestalled, and would not now forestall, competitive construction. Only legislation would do that. Many of the electric lines were started by local capitalists, real estate men or farmers. They got everyone along their proposed line interested; and in this local line there was the nucleus of a longer road. Local men could get concessions from public authorities which the officers of steam roads could not secure. In numerous cases promoters have built electric lines where there was no business to justify their existence, and have unloaded them on luckless investors, the promoters finding their profit in the first promotion and construction. Such lines for years lead a precarious existence on earnings from a local traffic so small that it would not yield a profit on the cost of electrifying a steam road, and, at the same time, take from the steam roads business that the latter need to enable them to earn a fair interest on their cost.

Whether it will be worth while for a steam road to put on motor car service or to electrify any particular part of its lines must depend entirely on the local conditions, and these are worthy of early and profound study. That the steam roads, taught by experience, will make a greater effort in future than they have in the past to provide such local service as will forestall electric competition is without question.

General News Section.

The Great Northern now furnishes passengers on its fast through trains with the news of the day, morning, noon and evening.

The Chicago & North Western is extending its telephone train despatching system to the line between Chicago and Fond du Lac, Wis.

The Mauretania, leaving New York, August 25, is now said to be the vessel which will first make the stop at Fishguard, Wales, to land passengers from New York, bound for London.

According to a press despatch of August 9, nearly 1,000 workmen in the freight transfer sheds of the Canadian Pacific at Fort William, Ont., had gone on strike for an increase of pay.

A press despatch from Salt Lake City says that the Southern Pacific, which uses oil fuel on locomotives extensively, has decided to use oil burners on the division between Sparks, Nev., and Carlin.

On Thursday morning, July 29, the Twentieth Century Limited Express of the Lake Shore & Michigan Southern was run from Toledo, Ohio, to Elkhart, Ind., 134 miles, in 110 minutes, which is 3½ minutes better than the best of the very fine records heretofore made by this train over this division. The train left Toledo behind time and made up 27 minutes on its schedule.

The Philadelphia & Reading is putting in telephones on its line between Gettysburg and Harrisburg with a view of using them in block signaling. Telephone communication will be carried on over the telegraph wires. This joint use of the same wire for both telegraph and telephone has been in vogue for some time on the Port Reading branch, also on the Schuylkill & Susquehanna branch.

The Oregon Railroad & Navigation Company has established a semi-weekly refrigerator car service between Riparia, Wash., and Spokane for fruit shippers who ship in less-than-carload lots. A similar service has been established on the Tekoa-Spokane line for Wallace, Wardner and other points. Shippers are asked to hold their green fruit for these cars and no extra charge will be made for shipping in them.

The General Managers' Association of Texas has decided to require cotton compress companies to insure all cotton stored for shipment at the compresses, otherwise the roads will refuse to haul it. The answer of the compress companies has not yet been given. Heretofore, when such cotton has been burned the loss has fallen on the railways indirectly, even though the owners have it insured, as the insurance companies would claim the fire started from a spark from a locomotive and would sue the railway to recover the loss.

The Chicago, Burlington & Quincy and the Kansas City Southern have filed statements with the Secretary of State of Missouri giving their expenditures in maintaining legislative agents at Jefferson City, the state capital, at the last session of the legislature. Newman Conkling, formerly a representative from Carroll county, represented both roads, and the statements show that the Burlington paid him $2,201 and the Kansas City Southern $765. These two roads and the Illinois Central are the only roads that have filed statements as required by the anti-lobby law passed by the legislature in 1907.

W. B. Angels, attorney for the Wisconsin Central at Plainfield, Wis., under conviction for violating the anti-pass law but never sentenced, has been granted a pardon by the Governor of Wisconsin. Mr. Angels was convicted on a friendly suit brought to test the validity of the anti-pass law of 1907. At the time of the passage of the statute Mr. Angels had a pass from the railway company and used it in riding from Plainfield to Stevens Point. Arriving there he informed the district attorney that he had violated the law. The case was then brought, Mr. Angels was found guilty and the law was held to be valid. Then the situation became serious, for the punishment was a term in prison. Sentence was suspended until a pardon was granted by the Governor.

The commission appointed by President Taft to investigate for him the question of what amendments ought to be made in the interstate commerce law and the anti-trust law will hold a meeting in Washington this month. The commission includes three members of the Cabinet and Mr. Prouty, of the Interstate Commerce Commission, is a member. The President's plan, so far as he has formed a plan, is said to be to make the Interstate Commerce Commission strictly judicial and transfer its non-judicial functions to the office of the commissioner of corporations in the department of commerce and labor.

H. B. Earling, general superintendent of the Chicago, Milwaukee & Puget Sound, is quoted in the Seattle *Post-Intelligencer* as announcing that this road is equipping its locomotives on certain divisions to burn oil. The change from coal as a fuel is to be made largely to avoid setting fires in forests. From Seattle to Cle Elum the road passes through a heavily timbered country and there oil will be used. It will also be used from Malden to Avery and from Avery to Alberton. Continuing Mr. Earling said: "In many instances, along the lines the most picturesque timber lanes through which railways have been built have disappeared, some from fires and others through the advance of the lumberman. The president (A. J. Earling) is anxious to save some of the beauty spots for all time, for in 25, or even 10 years, there will be nothing along the great railways to indicate to the tourist what a wealth of timber once stood by the tracks."

The Siberian Limited and Other Continental Trains.

L. J. Garcey, American agent of the International Sleeping Car Company (281 Fifth avenue, New York City), advertising in the *Official Guide*, prints the time-table of the Trans-Siberian Express between London and Yokohama. This time-table is severely condensed, however, only eight intermediate stations being shown, and the reader's interest in it is somewhat weakened by the long stops, which make it impossible to even guess at the rate of speed. Moreover, where two stations (contiguous in the time-table) are 150 hours apart, the speed probably varies a good deal. This is the time between Moscow and Irkutsk eastbound; westbound the time between these two cities is 129 hours. The difference is partly accounted for, no doubt, by the different standards of time used. The time from London to Yokohama is 15 days, the journey beyond Vladivostock being made by water, of course. Besides the Trans-Siberian Express the following 29 limited trains are made up exclusively of the cars of the International Sleeping Car Company: Berlin-Naples-Palermo Express; Berlin-Vienna Express; Bombay Express; Cabourg Express; Denmark Express; Calais-Mediterranee Express; Carlsbad Express; Racetracks of Normandy; Engadine Express; Cairo-Luxor Express; Lloyd Express; Nord Express; Nord-Sud (Brenner) Express; Orient Express; Ostende-Vienna Express; Ostende-Vienna-Triest Express; Ostende-Carlsbad-Marienbad Express; Ostende-Nuremberg-Munich Express; Paris-Barcelona Express; Paris-Rome-Naples-Palermo Express; Peninsular Express; Riviera Express; Saint Petersbourg-Vienna-Nice-Cannes Express; Savoie Express; Simplon Express; Trans-Siberian Express; Sud Express; Trouville Express; Vichy Express.

Water Ways Commission to Visit Europe.

Seven of the 12 members of the national water ways commission, a commission authorized by Congress to investigate the water ways of Europe and Canada as well as those of the United States, sailed from New York this week on a 10-weeks' examination of the water ways of Europe. Senator Theodore E. Burton, of Ohio, is chairman, and other members

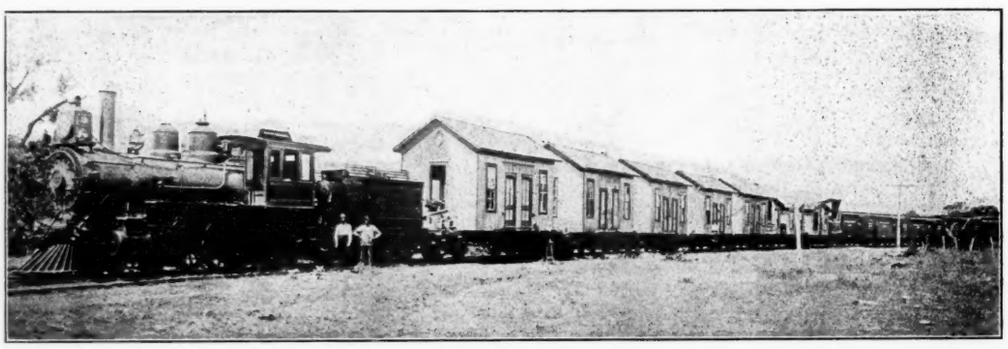
are Messrs. Gallinger, Simmons, Stevens, Wanger, Sparkman and Cassiday. With the party are Logan G. McPherson, Prof. Emory R. Johnson, Col. William H. Bixby, of the engineer corps of the army, and Herbert Knox Smith. Senator Piles, of Washington; Senator Smith, of Michigan; Senator Lorimer, of Illinois, and Representative Moon, of Tennessee, expect to join the party on September 8. The party expects to be back in New York October 23.

Correspondence School for Firemen.

The Brotherhood of Locomotive Firemen has established at Indianapolis a school for locomotive firemen and enginemen to be conducted by correspondence. The course of study is to be simple and the tuition will be placed practically at cost. John F. McNamee is manager of the enterprise.

A Trainload of Houses.

The illustration shown herewith is made from a photograph taken on the line of the Weatherford, Mineral Wells & Northwestern Railway, Texas, sent to us by an officer of the company. The first five cars carry each a two-room cottage 14 ft. wide and 28 ft. long. The extreme height of these buildings is 15 ft. 8 in. On the next three cars are lean-to kitchens that had formed parts of these houses. The four box cars contain other "wreckage" which, with the houses, came from the town of Rock Creek, a coal mining settlement owned by the Texas-Pacific Coal & Fuel Co. and which had been abandoned.



A Trainload of Houses.

This scene affords a characteristic illustration of the free and untrammeled spirit which pervades everything and everybody in Texas. Such little obstacles as narrow cuts or tunnels or overhead bridges appear to be unknown. Whether or not our Texas friends make a regular business of moving court houses on cars, as has been done in Kansas, we are not informed; but evidently the Mineral Wells Route is equal to any business which may be offered.

What worries us most, however, about this train is the question whether or not it will be legal to start it. Of course, it would be highly improper, if not criminal, to move freight which had not been properly classified and tariff-fied by the sovereign people of the state of Texas, represented by their board of railway commissioners, and we have never seen two-room houses mentioned in the Texas official classification. Who could justly decide how many times first-class should be charged for dwelling houses? They ought to be K. D., released O. R.

Hygienic Benefits of the Subway.

The London *Lancet* may keep for its own British uses its fears of a race physically demoralized by the leg-saving tram cars, elevators and moving platforms. For us in New York muscular culture has not departed with the development of cheap transit facilities and lifts. On the contrary, new specialties in physical exercise are among the prime results of trolley car, "L" road and subway conditions.

For one thing, the disproportion of seats to passengers has inured us to twice-daily rigors like to those of the football rush. We have also grip, arm and shoulder exercises with the hanging straps, with balancing tests serving the whole muscular system when the straps, like the seats, are full. If we need practice in the physical art of making the deed coincide with the thought, there is always ready to our ears the "Step lively!" command of guard or platform man.

Self-control we learn, with nerve-saving submission to inexorable circumstance, as we are handled and herded by traction's servants. Packed into the hot boxes which are rush-hour cars, we are sweated at least out of the fatness of personal arrogance. And from the grind of steel on steel, with the not infrequent jar of flat wheel on time-worn rail, we get every variety of the vibration treatment recommended for stagnant systems.

No, Dr. Lancet, we are not suffering over here from the super-relaxation of nothing-to-climb and no-need-to-walk. Our sympathy without fellow-feeling is for our London cousins under the menace of atrophied sinews.—*New York World.*

Special Libraries Association.

Special libraries connected with large industrial concerns, banking and insurance companies, commercial organizations, legislative and executive commissions, etc., have become so common that at the July conference of the American Library Association held at Bretton Woods, N. H., the "Special Libraries Association" was organized, with the following officers: President, J. C. Dana, Free Public Library, Newark, N. J.; vice-president, Robert H. Whitten, librarian, Public Service Commission, New York, First district, New York City; secretary, Anna Sears, librarian, the Merchants' Association of New York; executive committee, Herbert O. Brigham, Providence; George W. Lee, librarian, Stone & Webster, Boston.

The first annual meeting will be held in October, at the rooms of the Merchants' Association of New York. Among the 50 organizations which have signified their intention to hold membership are the following: Bible Teachers' Training School, Commonwealth Edison Co., Equitable Life Assurance Co., Fisk & Robinson, Missouri Botanical Garden, Philadelphia Commercial Museum, Public Sociological Library of New York School of Philanthropy and Stone & Webster.

Prof. Hatt at International Association for Testing Materials.

Professor W. K. Hatt, of Purdue University, will represent the Forest Service of the United States at the Congress of the International Association for Testing Materials at Copenhagen September 7 to 11, and will also report on certain problems in Wood Preservation in Germany. His European address will be Care of Al Peters, 6 Unter den Linden, Berlin.

The Rule of the Road.

The Lake Shore & Michigan Southern is well advised in giving up its left-handed trains which have long been an anomaly in American railroading. Even if the English practice had a demonstrable superiority, as some psychologists on theoretical grounds maintain, the advantages of uniformity throughout the United States are more than an offset, and it is a pity that Canada and the United States are not likely ever to come to an agreement on this point. The inconvenience of a lack of uniformity is to be noted in several countries, Italy among them, where each locality has its own rule of the road. In Rome one turns to the left, in Florence to

the right. This is extravagant local option—turning out for others is one of the small things that should be made as automatic as possible. How deeply ingrained a habit may become many American automobilists in England have found out for themselves, with not a little risk of disaster.—*Springfield Republican.*

Railway Built by One Man.

The Asherton & Gulf Railroad was opened for traffic on July 28, when the first train was run over it. This railway, which is 32 miles long and extends from Asherton Junction, Tex., on the International & Great Northern to Asherton, Dimmit county, Tex., was conceived and financed by one man, Asher Richardson. At Asherton Junction a frame passenger and freight station and side tracks have been built, and at Asherton a fine two-story station has been put up. The second story of the station at Asherton will be used for the general offices of the company. Since the building of the road three new towns besides those mentioned, Farmington, Light and Catarina, have sprung up. The traffic of the road will consist of cotton, timber, live stock and other agricultural products. Mrs. Asher Richardson, wife of the builder of the road, has been appointed assistant to the general superintendent.

The Idaho Collision of July 31.

The disastrous butting collision on the Spokane & Inland, reported in our issue of August 6, occurred at Gibbs, Idaho, one and one-half miles west of Coeur d'Alene. This is the second time that we have corrected the location of this collision; but the present statement comes from a man who was on the ground. At the time this report was sent the total number of injuries was 115, of which 13 were fatal. Our correspondent says:

Idaho Collision.

The two trains were each composed of three coaches, but the eastbound train was of heavier cars of recent construction, while the other train, which suffered the worst damage, was composed of cars in use for six years and of a light type. The heavier cars suffered very little damage while the motor of the light train was smashed to kindling wood, little remaining above the running gear. It was in this car that the great loss of life occurred.

Both trains were packed with people incident to the land seekers' rush, but the eastbound, according to statements of the passengers, was standing still at the time of the collision while the other was running about 20 or 30 miles an hour.

The heavy motor car rode over the lighter car, crushing it into a space of 12 ft. and completely carrying away everything above the floor. The motorman of the eastbound train escaped by jumping. At the time of writing the motorman of the westbound train was not expected to live.

The car shown in the photograph at the left is the leading car of the eastbound train. It will be seen that the leading car of the westbound train is wholly demolished above the floor.

A Heavy Train on the New York Central.

On Sunday, July 25, a coal train of the New York Central which was run from Clearfield, Pa., to Avis, three miles from Jersey Shore, in 8 hours and 25 minutes, weighed 7,381 tons. It consisted of 105 cars of coal and was drawn by engine No. 2,908. This engine is class G-6-a, weighing 211,000 lbs. on drivers and 25,000 lbs. on leading truck; total weight of engine, 236,000 lbs.; weight of tender, loaded, 150,000 lbs.; steam pressure, 200 lbs. per sq. in.

"Citizen Harriman."

Edward H. Harriman is on a trip to Europe. Ordinarily there would be nothing added to this announcement beyond an exhortation to Emperor William to chain down his railways and to other monarchs to put their crowns and other valuables in the safe at night. But Mr. Harriman is going off on a pleasure trip and so many mean things have been said about him that it will not hurt any to change the tune a moment while he is out of the country and not able to take any advantage of the lapse from the cold attitude of severity that is usually used in mentioning the name of Harriman.

Of all the great railway men developed in this generation E. H. Harriman is easily the biggest and the best. The head of a railway company, under the rules of the game, must work for his stockholders, whether it is for the advantage of politicians, shippers and consumers. It is his job to do the best he can for the interests entrusted to his care. Harriman is not only a financier but he is a builder and an operator. Lucky is the town, city or community that has a Harriman road. He insists on a good roadbed, level track, safe track and the convenience and comfort of the traveler and the shipper. The Harriman roads are noted as the best in the country. When Harriman gets hold of a one-horse or played-out track and right of way he proceeds to put it in first class condition. He does not raise the rates or fares, although he doubtless charges a-plenty, but he insists that enough of the funds go into real improvements to make a railway. And that is where he stands ahead of a good many others and why Harrimanism is not such a bad thing as some people have been led to think.

Just because Mr. Harriman got into a dispute with Mr. Roosevelt over some campaign funds, in which Harriman proved himself about right in spite of the fact that you can't go against the President, is no reason why his ability and wisdom should not be recognized. He makes better railways, and there is more need for improvement that way than there is in some others which are being discussed. So far as we can see, he believes in giving every interest along his road a fair deal.

He is a public benefactor from that standpoint. He uses his power fairly, and he uses it. He is a great man, and as good or better than the ordinary citizen who looks upon him as the personification of the money power, seeking whom it may devour. He is a strong man in the financial world, but that should not be against him, when the financial world is the object which most of us want to reach. He is a good American and he spends his money on American railways, not on foreign titles, race horses, old editions or other bad habits. If he is not perfect, and we don't think he is, he is no exception to the rule and is worthy of the praise of his fellow citizen for the good he does and has done.—*Hutchinson (Kan.) News.*

A Contrast.

It costs as much to ship certain classes of freight from Los Angeles, Cal., to Bakersfield, 167 miles, as it does from New York to Los Angeles by way of the Tehuantepec route. The rates on certain classes of heavy freight from New York to Los Angeles is 50 cents a hundred pounds—$10 a ton. It is

loaded on a ship of the American-Hawaiian line at New York, which carries it to the Atlantic end of the Tehuantepec National Railway. There the company transfers it to freight cars and transports it across Mexico, 187 miles, to Salina Cruz, the Pacific terminus of the railway. There it is again handled by the transportation company and transferred to another ship, which takes it to San Diego. At that port it is once more transferred to cars and taken to Los Angeles, 125 miles. In other words, the carrier brings the freight more than 5,000 miles by water, 312 miles by rail, and transfers it three times en route, passing it over three wharves. The rate on the same freight from Los Angeles to Bakersfield, 167 miles, is exactly as much as from New York to Los Angeles.—*Exchange.*

Master Car-Painters.

The fortieth annual convention of the Master Car and Locomotive Painters' Association will be held at Niagara Falls September 14, 15, 16 and 17; headquarters at the Cataract House. Rooms without bath, $3; extra large rooms, $3.50. Rooms with bath, double, $4; single, $4.50. The above, per day, per person, American plan. Members can secure reservations by addressing H. W. Isaacs, manager.

The list of subjects, essays, queries and special papers to be presented at this convention contains the following, the names following the titles being those of the men who will discuss the several topics, except where otherwise stated.

Subject No. 1.—"Best method of painting new steel passenger cars." H. C. Lafferty, Standard Steel Co.; Wm. A. Breithaupt, Pullman Co.; C. C. Abel, American Car & Foundry Co.

***Report** of Committee on Tests.*—By W. O. Quest (P. & L. E.), Chairman.

Paper.—"Pigments for the Protection of Steel and Iron." By Henry A. Gardner, Chief Chemist Scientific Section Paint Manufacturers' Association of the United States.

Query No. 1.—"Can Decalcomanic Transfers be used for lettering passenger cars?" J. D. Wright, B. & O.

Subject No. 2.—"Cork as a preventive of moisture in finishing steel passenger cars." John F. Gearhart, Pennsylvania; W. H. Green, American Car & Foundry Co.; Geo. W. Arnold, New York Shipbuilding Co.; Harry Carson, Harlan-Hollingsworth.

Query No. 2.—"Maintenance of Passenger Car Floors." A. J. Bruning, L. & N.

Essay.—"The Master Painter and the Materials he uses." W. O. Quest, P. & L. E. Ry.

Subject No. 3.—"Best method of maintaining the interior of Refrigerator Cars." W. J. Orr, Erie; T. J. Mullally, Armour Car Line; O. P. Wilkins, Norfolk & Western.

Query No. 3.—"Cleaning and maintaining front ends of Locomotives." M. L. Shaffer, Northern Central.

Essay.—"The Master Car and Locomotive Painter." By an ex-Master Painter.

Subject No. 4.—"Lead vs. Glue on car sheathing and battens." B. E. Miller, Lackawanna; J. T. McCracken, Interboro; W. H. Truman, Norfolk & Southern.

Query. No. 4.—"Is the expense of silvered gothic glass warranted?" A. H. F. Phillips, N. Y., O. & W.

The secretary of the association is A. P. Dane, Reading, Mass.

Southern & Southwestern Railway Club.

The next meeting of this club will be held at the Mechanical and Manufacturers' Club, Candler building, Atlanta, August 19, at 10 a.m. Dr. T. A. Hancock, for 18 years surgeon of the Southern Railway, will lecture on First Aid to the Injured. This is the regular barbecue meeting, and the barbecue in the afternoon will be open to those who have their 1909 cards.

Railway Signal Association.

The annual meeting of this association will be held at Hotel Seelbach, Louisville, Ky., October 12, 13 and 14. It is expected that on Friday, the fifteenth, there will be an excursion to Mammoth Cave, which is 90 miles south of Louisville, on the Louisville & Nashville. Members intending to go on the excursion should procure their transportation before leaving home. The station on the Louisville & Nashville is Glasgow junction. The Mammoth Cave Railway will make a special rate of $1 from the Junction to the Cave and back, provided there is a party of sufficient size.

Central Railway Club.

The next regular meeting and fall outing of the Central Railway Club will be held at Buffalo on Friday, Sept. 10. There will be a trip down the Niagara River to Electric Beach, where a dinner will be served. The boat will leave the foot of Main street at 10 a. m. Returning, stops will be made at the Bedell House and other points, and the regular meeting will be held at the Hotel Iroquois at 8 p. m. The feature of the evening will be a lecture on The Safe Transportation of Explosives by Col. B. W. Dunn.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

Air Brake Association.—F. M. Nellis, 53 State St., Boston, Mass.
American Association of Demurrage Officers.—A. G. Thomason, Scranton, Pa
American Assoc. of Local Freight Agents' Ass'ns.—G. W. Dennison, Penna. Co., Toledo, Ohio
American Institute of Electrical Engineers.—R. W. Pope, 33 West 39th St., New York; second Friday in month; New York.
American Railway Association.—W. F. Allen, 24 Park Place, New York.
American Railway Bridge and Building Association.—S. F. Patterson, B. & M., Concord, N. H.; Oct. 19, 1909; Jacksonville, Fla.
American Railway Engineering and Maint. of Way Assoc.—E. H. Fritch, Monadnock Bldg., Chicago.
American Railway Industrial Association.—R. E. Wilson, Ry. Exchange, Chicago
American Railway Master Mechanics' Association.—J. W. Taylor, Old Colony Bldg., Chicago.
American Society for Testing Materials.—Prof. Edgar Marburg, Univ. of Pa., Philadelphia.
American Society of Civil Engineers.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and August; New York.
American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., N.Y.; 2d Tues. in month; annual, Dec. 7-10; New York.
American Street and Interurban Railway Association.—B. V. Swenson, 29 W. 39th St., New York; Oct. 18-22; Denver, Colo.
Association of American Railway Accounting Officers.—C. G. Phillips, 143 Dearborn St., Chicago
Association of Railway Claim Agents.—E. H. Hemus, A., T. & S. F., Topeka, Kan.
Association of Railway Telegraph Superintendents.—P. W. Drew, Wisconsin Central Ry., Chicago.
Association of Transportation and Car Accounting Officers.—G. P. Conard, 24 Park Place, New York.
Canadian Railway Club.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.
Canadian Society of Civil Engineers.—Clement H. McLeod. Montreal, Que.; irregular, usually weekly; Montreal.
Central Railway Club.—H. D. Vought, 95 Libery St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
Freight Claim Association.—Warren P. Taylor, Rich., Fred. & Pot. R. R., Richmond, Va.
International Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York.
International Railway Fuel Association.—D. B. Sebastian, La Salle St. Station, Chicago.
International Railway General Foremen's Association.—E. C. Cook, Royal Insurance Bldg., Chicago.
Iowa Railway Club.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month; except July and August; Des Moines.
Master Car Builders' Association.—J. W. Taylor, Old Colony Bldg., Chicago.
New England Railroad Club.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tues. in month, ex. June, July, Aug. and Sept.; Boston.
New York Railroad Club.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
North-West Railway Club.—T. W. Flannagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, August; St. Paul and Minn.
Railway Club of Pittsburgh.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month; except June, July and August; Pittsburgh.
Railway Signal Association.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa
Railway Storekeepers' Association.—J. P. Murphy, Box C, Collinwood, Ohio.
Roadmasters' and Maintenance of Way Association.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.: Nov., 1909; Washington.
St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
Society of Railway Financial Officers.—C. Norquist, Chicago; Sept. 7-8; Fort William Henry, Lake George, N. Y.
Southern Association of Car Service Officers.—J. H. O'Donnell, Bogalusa, La.
Southern and Southwestern Ry. Club.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., April, Aug. and Nov.; Atlanta.
Traveling Engineers' Association.—W. O. Thompson, N. Y. C. & H. R. R.R., East Buffalo, N. Y.; September, 1909; Denver.
Western Canada Railway Club.—W. H. Rosevear, 199 Chestnut St.; Winnipeg; 2d Mon., ex. June, July and Aug.; Winnipeg.
Western Railway Club.—J. W. Taylor, Old Colony Bldg., Chicago; 3d Tuesday each month, except June, July and August; Chicago.
Western Society of Engineers.—J. H. Warder, Monadnock Bldg., Chicago; 1st Wednesday, except July and August; Chicago.

Traffic News.

Traffic men of the Erie met in Chicago on Tuesday and Wednesday of this week for their annual conference. Heretofore these meetings have been held in New York. About 140 officers and freight and passenger representatives were in attendance.

The Manhattan Navigation Co., running freight boats between New York and Albany, announces that beginning next week passenger steamers will be run daily, leaving West Thirteenth street, New York City, at 5:30 p.m. The steamers are the Saratoga and the Frank Jones.

On August 9 the Boston & Maine announced its eighth reduction in freight rates westward from Boston on export shipments. This new tariff goes into effect September 3 and is made to meet the last reductions announced by the lines running west from Philadelphia, Baltimore, etc.

One hundred and fifty carloads of lumber for export were recently taken to Gulfport, Miss., instead of New Orleans, for the reason, it is said, that the terminal charges at New Orleans are excessive. The lumber, which came from Bogalusa, La., was not taken to Gulfport by rail but was sent over the New Orleans Great Northern to Slidell, where it was unloaded and made into rafts on Lake Pontchartrain. From that point it was floated a distance of almost 100 miles through the Rigolets in chain rafts to Gulfport.

B. N. Baker, acting in behalf of President Taft, has investigated the freight tariffs on the Panama Railroad and finds that discriminations in rates in favor of shipments from Europe, which were established years ago, are still maintained, in spite of the fact that the road is now owned by the United States Government. On dry goods, machinery and other important commodities the rate by rail across the isthmus is from 10 to 75 per cent. higher on shipments coming from New York than on those coming from Europe.

STATE COMMISSIONS.

The Corporation Commission of Oklahoma has been holding hearings on its proposed order requiring all foreign corporations doing business in Oklahoma to maintain general offices in that state, hold annual meetings of directors there and keep at the general offices in the state complete records of all operations. Frank Nay, general auditor of the Chicago, Rock Island & Pacific, testified that if this order were made effective the initial cost to the Rock Island of establishing the offices in Oklahoma would be $100,000, and that their maintenance would require the addition of 445 men to the payroll and an increased expense of $27,000 monthly.

The Washington Railroad Commission has ordered the Great Northern Express Company and the Great Northern Railway to put express agents at Peshantin, Malaga, Winchester, Mohler, Chattaroy, Camden, Bossburg and Blue Creek. The road is required to stop enough trains at these places to handle express matter. That the commission is busily exercising its supervisory powers is shown by the fact that on the same day that it issued the above order to the Great Northern it issued the following additional orders: The Oregon Railroad & Navigation Company to build stations at Chester Canyon, Lewiston Junction and Lowdens, and to build stations and places for caretakers at Hooper and Hale; to move its present station at Alberton to a point closer to the site of its stockyards; to furnish water for stock at the stockyards at St. John; to install electric lights at Oakesdale; to place a caretaker at Turner; to run a train twice a week from Dayton to Turner and Wheatstone; to put a caretaker at Huntsville; to provide an additional freight room at Touchet; to supply water in the stockyards at Waitsburg, and to build a station and sidetracks at Nine Mile.

Edward G. Connette, recently appointed transportation engineer of the New York Public Service Commission, First district, was born in 1863 at Austin, Ind. He began railway work when he was 15 on the Jeffersonville, Madison & Indianapolis, now the Louisville division of the Pennsylvania. He served in various positions in the engineering and operating departments of different steam roads for nine years, and in March, 1890, was appointed superintendent of the United Electric Railway of Nashville, Tenn. This company was a consolidation of four street railways, and during the first year of Mr. Connette's work the roads were reconstructed and electric equipment was installed. The following year Mr. Connette was made general manager and in 1897 was also made general manager and chief engineer of the Cumberland Electric Light & Power Co. On April 1, 1900, he was elected vice-president and general manager and a director of the Syracuse Rapid Transit Co. of Syracuse, N. Y. In October, 1905, he was appointed general manager of the Worcester Consolidated Street Railway and is at present general manager and a director of the company and also of the Worcester & Southbridge, Worcester & Blackstone Valley, Marlboro & Westboro, Worcester & Holden and Worcester & Webster, comprising a total mileage of about 273 miles.

The Railroad Commission of Louisiana has rescinded its order requiring the Texas & Pacific to build a passenger station in New Orleans east of the Mississippi river.

The Railroad Commission of Louisiana has authorized all the railways in the state to haul free of charge or at reduced rates stone, gravel, etc., to be used in the construction of good roads.

The Railroad Commission of Louisiana has adopted a rule relative to the reweighing of cars loaded with lumber on which weights are disputed. There shall be no charge for reweighing when the second weighing shows a variation of 1 per cent. or more from the first weight. When the second weighing does not show this much of a variation the carrier may charge $2.50 for each car reweighed.

The Railroad Commission of Louisiana has issued an order providing that the rates on native grown green or ripe fruits, melons and vegetables in carloads, minimum weight 20,000 lbs., shall not exceed Class C, Western Classification, the maximum rate to be charged not to exceed 30 cents per 100 lbs. On L.C.L. shipments the rates shall not exceed Fourth Class, Western Classification. Joint rates shall be the sum of the local rates, less 10 per cent., and on carload shipments over two lines the maximum rate shall not exceed 40 cents per 100 lbs. On carload shipments over three or more lines the maximum rate shall not exceed 60 cents per 100 lbs.

The Railroad Commission of Louisiana has fixed distance tariffs on native grown corn and oats and their products and rules governing milling-in-transit and stopping-in-transit of shipments of corn and oats. The rate per 100 lbs. for corn and oats for distances of 10 miles and under is 5 cents and for products of corn and oats 7 cents, and an increase of 1 cent is made for each increase of 10 miles in distance up to 50 miles. The rate on corn and oats for distances of 50 to 75 miles is 10 cents; for distances of 75 to 100 miles, 11 cents; for distances of 100 to 120 miles, 11½ cents, and for distances over 120 miles, 12½ cents. The scale of increase for products of corn and oats is practically the same. Two-line carload rates shall be the combination of local rates less 10 per cent. with a maximum of 15 cents per 100 lbs. on corn and oats and 17 cents per 100 lbs. on their products. Three-line carload rates shall be the combination of local rates less 10 per cent. with a maximum of 18 cents per 100 lbs. on corn and oats and 20 cents on their products. On movement of grain through elevators no elevator charge will be allowed or paid out of the freight rate, but the elevator charge will be in addition to the freight rate. Shipments of corn and oats may be stopped in transit, when the stopping point is in direct route from point of origin to destination. Corn or oats stopped in transit, except for milling, will be subject to an additional charge of $2 per car. When shipments of shelled corn or products of corn are made which are reshipments of corn that came into transit station in car and the original freight bill and copy or bill of lading are surrendered, the weight of the shipment of the car corn into transit station will be reduced 20 per cent., and freight charges on the car corn reduced accordingly. This reduction is an allowance for cobs.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF JUNE, 1909.
(See also issue Aug. 6.)

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenues (or deficit).	Outside operations. net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Atchison, Topeka & Santa Fe	7,458	$4,365,367	$1,608,082	$6,681,722	$1,075,561	$836,134	$151,779	$1,703,826	$146,860	$3,914,160	$2,767,562	.....	$290,008	$2,477,554	$222,481
Atlantic Coast Line	4,468	1,408,914	441,029	2,033,017	290,517	353,782	38,447	692,846	66,352	1,441,944	591,073	.....	103,510	487,563	30,532
Bangor & Aroostook	514	100,397	52,113	163,710	20,978	17,334	2,802	30,097	10,007	81,218	82,492	.....	2,920	79,572	‡21,461
Chesapeake & Ohio	1,891	1,820,995	404,196	2,417,592	345,515	396,734	51,911	611,448	55,719	1,461,327	956,265	$5,815	67,100	894,980	373,939
Chicago & Eastern Illinois	965	630,815	130,733	818,128	49,815	87,817	22,982	273,304	40,403	474,321	343,807	3,523*	26,500	313,784	‡71,694
Chicago, Rock Island & El Paso	111	45,891	20,908	72,075	7,787	9,541	743	16,669	1,609	36,349	35,726	385	2,504	33,607	‡9,621
Chicago, Rock Island & Pacific	7,414	2,830,672	1,623,821	5,155,476	729,066	597,258	121,815	1,706,619	127,359	3,282,117	1,873,359	13,678*	194,516	1,665,165	410,187
Cleve., Cin., Chicago & St. Louis	1,982	1,339,959	635,383	2,172,925	294,392	318,876	83,204	813,192	50,698	1,560,362	612,563	898*	74,000	537,665	26,196
Delaware & Hudson Co.	845	1,259,623	233,062	1,545,739	138,570	242,852	14,501	532,544	34,693	963,161	582,578	932*	35,000	546,647	‡48,115
Delaware, Lackawanna & Western	893	2,097,936	596,168	2,882,952	383,637	378,224	66,583	729,335	56,934	1,614,713	1,268,239	26,166	98,400	1,196,005	110,646
Denver & Rio Grande	2,552	1,381,530	419,665	1,880,767	296,547	300,782	45,768	597,754	47,177	1,288,028	592,739	5,096	58,073	539,762	‡89,588
Duluth, South Shore & Atlantic	593	165,601	89,565	269,483	62,713	32,161	8,772	94,880	6,342	204,868	64,615	2,033	21,816	44,832	‡7,480
Elgin, Joliet & Eastern (a)	908	616,802	3	657,959	62,208	113,837	3,817	181,065	20,709	381,636	276,323	.....	12,815	263,508	101,735
Grand Rapids & Indiana	591	204,161	127,050	352,630	64,964	63,079	10,924	143,518	13,698	296,183	56,447	186*	21,133	35,129	4,360
Gulf, Colorado & Santa Fe	1,518	520,504	241,340	851,457	205,596	125,710	21,308	342,698	29,434	724,746	126,711	.....	24,917	101,794	94,570
Houston & Texas Central	789	283,325	120,354	442,323	62,539	113,090	19,581	227,564	22,175	444,949	2,626*	.....	19,631	22,257†	22,777
Lake Erie & Western	724	283,697	61,968	364,973	56,600	65,091	15,386	143,329	9,965	290,371	74,602	.....	17,509	57,093	31,236
Lake Shore & Michigan Southern	1,511	2,345,090	875,733	3,648,559	538,031	488,721	96,734	1,067,078	65,883	2,256,447	1,392,112	7,828*	125,000	1,259,284	423,045
Michigan Central	1,746	1,374,443	597,759	2,177,051	333,081	278,399	69,388	774,841	35,614	1,491,323.	685,728	1,891*	94,000	589,837	8,875
Missouri, Kansas & Texas	3,072	1,175,572	590,730	1,890,871	234,881	214,245	53,322	735,375	69,085	1,306,908	583,963	1,333*	268	582,361	378,625
New York Central & Hudson River	3,587	4,214,511	2,592,956	7,619,154	1,042,591	1,077,026	180,502	2,365,085	193,653	4,859,217	2,759,937	27,426	362,775	2,424,588	610,842
Norfolk & Southern	582	150,315	54,819	218,980	33,887	31,446	6,521	65,694	14,151	151,699	67,281	2,513*	4,899	59,869	50,769
Norfolk & Western	1,941	2,215,087	448,238	2,745,450	352,274	452,254	45,287	713,803	60,813	1,624,431	1,121,019	1,132*	82,300	1,037,587	245,817
Pennsylvania R. R. Co.	4,087	8,878,189	2,507,563	12,236,595	1,612,484	2,086,764	169,559	3,900,394	329,949	8,099,150	4,137,445	59,462*	258,118	3,819,865	392,176
Pennsylvania Company	1,416	3,250,641	625,963	4,216,206	574,595	589,666	75,108	1,191,583	71,148	2,502,100	1,714,106	959	149,210	1,565,855	164,109
Philadelphia, Baltimore & Washington	716	779,516	563,741	1,519,230	215,813	256,345	22,764	594,092	36,386	1,125,400	393,830	.....	67,821	326,009	‡24,151
Pitts., Cin., Chicago & St. Louis	1,472	1,888,551	642,640	2,879,609	450,613	500,300	67,735	923,471	59,242	2,001,361	878,248	760*	110,175	767,313	‡14,054
St. Louis Southwestern	773	359,756	106,782	493,395	50,354	64,798	23,879	121,368	20,303	280,702	212,693	749*	15,118	196,826	82,400
St. Louis Southwestern of Texas	697	198,099	73,884	292,114	69,140	54,371	11,085	118,941	15,110	268,647	23,467	208*	8,333	14,925	60,070
San Pedro, Los Angeles & Salt Lake	1,099	470,750	242,821	755,282	86,571	84,273	28,394	229,210	28,054	456,502	298,780	3,365*	23,671	271,744	72,983
Seaboard Air Line	2,603	890,843	261,016	1,290,509	179,806	192,326	49,344	437,976	40,586	900,041	390,468	3,091*	54,222	333,155	130,087
Southern Railway	7,050	2,545,814	1,130,517	4,052,586	410,502	661,099	123,807	1,468,677	158,297	2,822,382	1,230,204	2,259	158,817	1,073,646	96,321
Texas & Pacific	1,885	638,449	292,542	996,654	178,001	192,909	15,938	439,200	30,602	856,650	140,004	555	38,000	102,559	29,995
Union Pacific	3,310	2,698,183	879,594	4,068,287	399,925	332,660	82,768	872,834	104,296	1,792,483	2,275,804	7,091	121,842	2,161,053	413,717
Vandalia	829	439,185	184,191	708,655	115,881	123,475	26,234	263,321	18,421	547,332	161,323	.....	23,243	138,080	‡2,203
Wabash	2,514	1,395,513	570,723	2,301,434	280,583	315,488	76,704	848,860	67,260	1,588,895	712,539	2,714*	64,495	644,330	‡7,784
FISCAL YEAR ENDED JUNE 30, 1909.															
Atchison, Topeka & Santa Fe	7,458	51,894,385	18,509,838	76,770,668	10,070,282	11,427,226	1,588,518	20,698,630	1,597,231	45,381,887	31,388,781	.....	2,616,806	28,771,975	3,962,399
Atlantic Coast Line	4,468	18,328,176	5,842,059	26,144,064	3,566,702	3,681,457	430,092	8,520,714	744,396	16,943,361	9,200,703	.....	1,119,538	8,081,165	2,071,140
Bangor & Aroostook	514	2,122,422	560,446	2,818,444	482,706	324,313	33,847	824,169	124,130	1,789,165	1,029,279	.....	17,920	1,011,359	207,789
Chesapeake & Ohio	1,891	20,885,511	4,482,004	26,630,717	3,101,151	4,938,938	466,042	7,328,683	532,024	16,366,838	10,263,879	27,080*	801,600	9,435,199	373,939
Chicago & Eastern Illinois	965	8,005,582	1,666,981	10,269,618	994,710	1,663,759	210,011	3,635,686	430,367	6,934,533	3,335,085	19,942*	274,115	3,041,028	20,523
Chicago, Rock Island & El Paso	111	467,371	252,420	783,309	87,156	100,014	7,381	239,466	19,193	453,210	330,099	691	29,733	301,057	34,287
Chicago, Rock Island & Pacific	7,414	36,557,518	16,897,447	57,386,846	8,421,295	7,184,445	1,362,761	21,462,440	1,540,504	39,971,445	17,415,401	143,771*	2,187,532	15,084,098	1,718,579
Cleve., Cin., Chicago & St. Louis	1,982	16,600,101	6,874,183	25,949,931	2,956,834	4,529,657	848,830	10,307,806	535,191	19,178,318	6,771,613	39,731*	855,347	5,876,535	868,965
Delaware & Hudson Co.	845	15,610,183	2,719,706	18,907,945	1,388,226	2,282,298	211,807	6,678,667	466,204	11,027,202	7,880,743	2,788*	416,749	7,461,206	‡298,790
Delaware, Lackawanna & Western	893	24,832,586	6,630,053	33,553,435	3,407,012	4,585,386	617,099	9,213,523	654,693	18,477,713	15,075,722	304,036	1,094,400	14,285,358	1,183,779
Denver & Rio Grande	2,552	15,163,254	4,784,418	20,876,571	2,530,109	3,572,326	467,269	7,294,231	588,639	14,452,574	6,423,997	43,538	762,823	5,704,712	‡1,048,797
Duluth, South Shore & Atlantic	593	1,634,089	915,123	2,719,338	445,281	327,791	100,884	1,027,071	78,491	1,979,518	739,820	7,866	203,600	544,086	4,420
Elgin, Joliet & Eastern (a)	908	6,375,889	487	6,846,196	623,159	1,322,831	46,753	2,090,280	170,401	4,253,424	2,592,772	.....	153,133	2,439,639	354,556
Grand Rapids & Indiana	591	2,783,091	1,504,903	4,605,291	571,967	721,064	122,088	1,828,287	163,719	3,407,125	1,198,166	5,183*	253,061	939,922	129,966
Gulf, Colorado & Santa Fe	1,518	8,933,034	2,905,745	12,552,900	2,093,214	1,947,734	246,526	4,554,028	372,128	9,213,630	3,339,270	.....	337,838	3,001,432	1,807,589
Houston & Texas Central	789	4,134,334	1,398,020	5,911,353	802,935	908,904	196,302	2,306,989	237,660	4,452,790	1,458,563	.....	173,430	1,285,133	97,130
Lake Erie & Western	724	3,349,499	759,019	4,340,963	641,335	879,823	133,878	1,703,438	120,923	3,479,397	861,566	.....	205,270	656,296	97,727
Lake Shore & Michigan Southern	1,511	26,902,748	9,437,471	41,485,460	5,029,050	6,184,634	1,006,575	13,200,039	700,642	26,120,940	15,364,520	51,283*	1,523,647	13,789,590	1,351,514
Michigan Central	1,746	16,935,505	6,270,278	25,481,599	3,101,724	3,597,475	731,652	9,783,206	422,376	17,636,433	7,845,166	60,383*	1,129,694	6,655,089	‡380,273
Missouri, Kansas & Texas	3,072	16,852,839	6,964,088	25,300,915	3,370,149	3,379,083	587,451	9,496,854	833,869	17,667,406	7,633,509	13,694*	967,309	6,652,506	488,878
New York Central & Hudson River	3,587	50,796,116	27,377,491	87,367,770	10,450,362	15,023,558	2,095,238	32,017,949	2,032,253	61,619,360	25,748,410	149,463	4,527,237	21,370,636	3,153,472
Norfolk & Southern	582	1,630,507	622,616	2,417,319	336,329	265,844	51,984	765,902	169,548	1,589,607	827,712	6,568*	70,099	751,045	402,231
Norfolk & Western	1,941	24,710,591	3,642,837	29,327,101	3,331,888	4,919,435	487,106	8,346,992	644,335	17,729,756	11,597,345	10,683*	1,008,800	10,577,862	1,378,878
Pennsylvania R. R. Co.	4,087	100,356,160	28,774,281	138,449,119	16,503,246	27,225,887	1,844,365	48,064,176	3,470,077	97,107,751	41,341,368	304,524*	2,370,314	38,666,530	‡112,978
Pennsylvania Company	1,416	31,290,450	6,733,540	41,681,765	4,572,227	6,629,147	759,773	14,076,874	847,562	26,885,583	14,796,182	29,224*	1,814,708	12,952,250	826,158
Philadelphia, Baltimore & Washington	716	8,072,811	6,906,783	16,851,646	2,187,292	2,913,625	266,092	6,906,256	364,729	12,637,994	4,213,652	.....	429,259	3,784,393	211,758
Pitts., Cin., Chicago & St. Louis	1,472	22,063,979	6,898,585	32,773,043	4,026,875	5,748,712	741,949	11,440,828	671,031	22,629,395	10,143,648	6,788*	1,415,940	8,720,920	276,001
St. Louis Southwestern	773	5,193,204	1,197,032	6,686,533	889,190	1,077,555	258,894	1,643,937	247,088	4,116,664	2,569,869	7,299*	180,441	2,382,129	251,041
St. Louis Southwestern of Texas	697	2,538,472	858,052	3,645,355	1,003,309	789,107	107,988	1,585,487	184,537	3,670,428	25,073*	2,860*	88,263	116,196†	295,737
San Pedro, Los Angeles & Salt Lake	1,099	4,432,438	2,552,386	7,450,461	1,018,357	1,012,166	305,169	2,419,387	213,470	4,968,549	2,481,912	31,480*	285,454	2,164,978	887,918
Seaboard Air Line	2,603	11,357,203	3,491,727	16,451,676	2,358,142	2,375,146	584,804	5,570,652	557,288	11,446,032	5,005,644	13,682*	623,935	4,368,027	1,266,030
Southern Railway	7,050	34,376,619	13,510,791	52,188,106	6,016,661	8,193,753	1,252,328	18,348,507	1,757,731	35,568,980	16,619,126	136,963	1,916,701	14,839,388	3,786,893
Texas & Pacific	1,885	9,891,984	3,684,678	14,537,923	1,860,216	2,321,303	183,576	5,792,539	399,919	10,557,553	3,980,370	19,181*	614,389	3,346,800	466,169
Union Pacific	3,310	32,960,699	9,719,646	46,949,311	4,707,280	4,845,605	1,015,670	11,011,686	1,202,414	22,782,655	24,166,656	18,934*	1,331,703	22,816,019	5,039,130
Vandalia	829	5,599,886	2,174,554	8,773,394	1,327,015	1,467,025	259,302	3,370,060	206,733	6,630,135	2,143,259	.....	297,016	1,846,243	‡55,493
Wabash	2,514	17,176,708	6,395,775	25,868,033	3,112,598	3,966,180	836,493	10,024,796	817,117	18,757,184	7,110,849	23,600*	809,637	6,277,612	‡80,692

(a) Includes Chicago, Lake Shore & Eastern. * Deficit. † Loss. ‡ Decrease.

New York: Joint Rates With Water Carriers.

Murray's Line v. the Delaware & Hudson.

A corporation carrying freight for hire but conducting its business exclusively on water, although a common carrier as that term is defined by the common law, is not a common carrier as defined by section 2 of the Public Service Commission law, and is not subject to the jurisdiction and supervision of the Public Service Commission. The commission has no power to order a common carrier subject to its jurisdiction and supervision to establish through routes and joint rates with a common carrier conducting its operations exclusively on water and not subject to the commission's jurisdiction.

The Delaware & Hudson does not violate Section 47 of the railway law by charging its local rate from its local stations to Green Island or to Albany on freight destined for New York city, and to be transported from Green Island or Albany to New York city by water via Murray's Line. The fact that a railway charges a local shipper more for transporting property between two points on its road than it charges for the same service when the property transported is received from a connecting railway and carried under a joint tariff established by the two railway companies does not establish a charge of undue preference.

It seems that one principal element determining the fair and equitable basis for the division of a joint rate between two carriers is the relative cost to each of performing the service for which the rate is paid.

For several years the companies in contest have been interchanging freight which was billed through on an agreed joint rate. Owing to a disagreement as to the division of the rate the railway in the spring of the present year told the complainant that after a named date it would refuse to continue operations under the joint rate. The effect of the enforcement of this notice would be to compel the payment of the local rate on the railway for freight delivered to Murray's Line at Albany and Green Island. Such local rates are considerably in excess of the division of the through rate which has been heretofore received by the Delaware & Hudson.

Murray's Line seeks to have its division of the through rate of the Delaware & Hudson the same as that in existence between the Delaware & Hudson and the New York Central & Hudson River on business to New York city.

In holding that the complainant has not established a case which permits of interference by the commission, attention is called to the fact that if the commission has in any way misconstrued any of the statutory provisions relied on by the complainants, a corrective can easily be applied by the legislature by amendment. The commission does not undertake to express what the law ought or ought not to be where the law is purely statutory.

COURT NEWS.

The New York State Public Service Commission, Second district, proposes to take action in the courts to fine the Erie for not putting up a station at Collins, Erie county. The commission made an order and the road filed plans last autumn, and six months later the road expressed the intention of beginning work "as soon as practicable," but no work has been done.

Car Surpluses and Shortages.

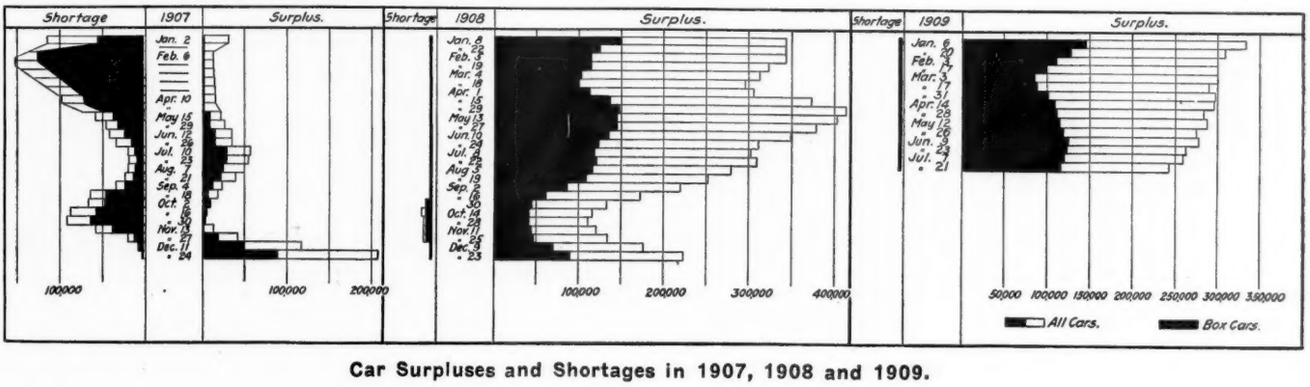
Arthur Hale, chairman, Committee on Relations between railways, of the American Railway Association, in presenting statistical bulletin No. 51-A, giving a summary of shortages and surpluses by groups from March 18, 1908, to July 21, 1909, says:

"The total surplus for the date of this report is 243,354, a decrease of 16,873 cars since our last fortnightly bulletin. Of this decrease, 2,684 are box cars and 9,608 coal and gondolas. The decreases in box cars in the West and Northwest are somewhat in excess of the net decrease, increases in the East having offset them to some extent. With the extension of the grain movement there should be reductions in the rather large surplus of box cars reported by the eastern and central territory. The coal car situation continues to improve in groups 2 (Eastern), 3 (Middle) and 6 (Northwestern), although there is still a substantial excess of this class."

The accompanying table shows the surpluses and shortages

CAR SURPLUSES AND SHORTAGES, MARCH 18, 1908, TO JULY 21, 1909, INCLUSIVE.

	Number of roads.	Surpluses. Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
July 21, 1909	165	116,221	9,971	78,675	38,487	243,354	106	169	31	33	339
July 7, 1909	170	118,905	10,727	88,283	42,312	260,227	152	86	246	46	530
June 23, 1909	166	121,441	12,099	89,292	40,112	262,944	211	190	193	233	827
May 26, 1909	158	118,077	14,940	97,006	43,687	273,710	83	99	1,011	47	1,240
April 28, 1909	161	107,665	16,487	110,538	47,638	282,328	144	106	74	173	497
March 31, 1909	158	101,344	20,428	128,546	46,282	296,600	158	98	116	27	399
February 17, 1909	159	98,512	23,924	135,208	43,797	301,441	266	97	11	96	470
January 20, 1909	162	127,204	26,723	116,680	41,057	311,664	163	21	139	35	358
December 23, 1908	158	87,350	16,247	79,595	38,885	222,077	471	42	289	217	1,019
November 25, 1908	160	45,194	12,157	43,854	31,624	132,829	7,923	178	900	209	9,210
October 28, 1908	158	39,383	10,185	31,541	29,803	110,912	8,175	167	2,261	236	10,839
September 30, 1908	160	42,593	10,365	49,795	31,039	133,792	7,313	450	224	127	8,114
August 19, 1908	160	106,367	13,494	92,500	40,642	253,003	465	90	105	194	854
July 22, 1908	166	120,580	14,401	125,739	47,960	308,680	115	37	330	27	509
June 24, 1908	163	123,112	18,042	130,149	41,995	313,298	266	34	120	31	451
May 27, 1908	160	144,697	20,075	162,695	54,437	381,904	82	13	12	18	125
April 29, 1908	159	147,971	24,350	186,742	59,542	413,605	145	42	16	64	267
March 18, 1908	160	103,509	25,122	119,205	49,206	297,042	533	151	250	73	1,007



Car Surpluses and Shortages in 1907, 1908 and 1909.

for the period covered by the report, and the chart shows surpluses and shortages for 1907, 1908 and 1909.

Crop Conditions.

The crop reporting board of the department of agriculture estimates the crop conditions as follows:

The average condition of corn on August 1 was 84.4, as compared with 89.3 last month, 82.5 on August 1, 1908, and 82.6, the average on August 1 for the past 10 years. Comparisons for important corn states follow:

States.	P. ct. of U.S. acreage in state.	Condition, Aug. 1, 1909.	July 1, 1909.	Aug. 1, 1908.	10-yr. Aug. av.
Illinois	9.4	91	94	77	84
Iowa	8.6	85	86	83	84
Texas	7.6	60	82	86	76
Missouri	7.5	88	91	74	80
Nebraska	7.3	93	91	86	83
Kansas	7.2	90	91	76	78
Oklahoma	5.4	63	94	80	82
Indiana	4.5	94	93	75	85
Georgia	4.1	90	90	89	86
Ohio	3.5	90	90	85	85
Kentucky	3.3	87	89	83	84
Tennessee	3.1	78	80	84	82
Alabama	3.0	76	77	87	82
North Carolina	2.7	78	83	91	87
Arkansas	2.7	76	91	79	81
Mississippi	2.6	69	72	86	78
Louisiana	2.0	88	91	87	80
South Carolina	2.0	84	87	88	81
South Dakota	1.9	92	93	90	86
Virginia	1.9	77	90	89	88
United States	100.0	84.4	89.3	82.5	82.6

Preliminary returns indicate a winter wheat yield of about 15.5 bushels per acre, or a total of about 432,920,000 bushels, as compared with 14.4 and 437,908,000 bushels, respectively, as finally estimated last year. The average quality of the crop is 90.3 against 90.1 last year. Comparisons for important winter wheat states follow:

States.	1909, preliminary. Yield, per acre, bush.	Production, thousand bushels.	Quality, per cent.	1908. Yield, per acre, bush.	Production, thousand bushels.	Quality, per cent.
Kansas	14.5	85,478	88	12.8	78,182	87
Indiana	15.3	34,241	82	16.6	45,169	95
Nebraska	19.4	42,040	95	17.8	40,317	90
Missouri	14.7	28,562	92	10.0	22,260	84
Illinois	17.4	33,721	91	13.0	30,212	91
Pennsylvania	17.0	25,551	93	18.5	29,415	94
Ohio	15.9	23,278	86	16.0	33,328	90
Oklahoma	12.8	14,848	94	11.6	15,625	85
California	14.0	12,096	92	14.6	11,680	92
Tennessee	10.4	8,133	85	10.0	8,190	86
Virginia	11.2	8,758	86	11.4	8,892	90
Maryland	14.5	11,034	83	16.4	12,546	94
Michigan	18.8	14,232	94	18.0	15,732	96
Texas	9.1	6,133	87	11.0	10,164	83
Kentucky	11.8	7,800	81	11.6	8,793	87
Washington	25.8	16,951	98	24.5	14,112	92
United States.	15.5	432,920	90.3	14.4	437,908	90.1

The average condition of spring wheat on August 1 was 91.6 as compared with 92.7 last month, 80.7 on August 1, 1908, and 81.1 the 10-year average on August 1. Comparisons for important spring wheat states follow:

States.	P. ct. of U.S. acreage in state.	Condition, Aug. 1, 1909.	July 1, 1909.	Aug. 1, 1908.	10-yr. Aug. av.
North Dakota	34.6	93	95	75	78
Minnesota	31.2	92	92	86	82
South Dakota	17.4	92	94	90	82
Washington	4.9	90	90	60	85
United States	100.0	91.6	92.7	80.7	81.1

The average condition of the oats crop on August 1 was 85.5 as compared with 88.3 last month, 76.8 on August 1, 1908, and 83.1 the 10-year average on August 1.

The proportion of last year's oats crop in farmers' hands on August 1 was about 3.3 per cent., or 26,323,000 bushels, as compared with 5.0 per cent. (38,000,000 bushels) of the 1907 crop on hand August 1, 1908, and 6.3 per cent. (53,000,000 bushels), the average proportion on hand for the past 10 years on August 1.

The average condition of barley on August 1 was 85.4 as compared with 90.2 last month, 83.1 on August 1, 1908; 84.5 on August 1, 1907, and 86.1 the 10-year average on August 1.

The average condition of rye on August 1, or at harvest, was 89.1 as compared with 91.4 last month; 88.3 on August 1, 1908; 88.9 on August 1, 1907, and 87.9 the 10-year average at time of harvest.

Railroad Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

G. A. Gandre has been appointed the acting treasurer of the Trinity & Brazos Valley, with office at Houston, Tex., succeeding O. H. Nance, resigned.

J. T. O'Dell, president of the Marquette & Bessemer Dock & Navigation Co., has been elected a vice-president of the Kansas City, Mexico & Orient.

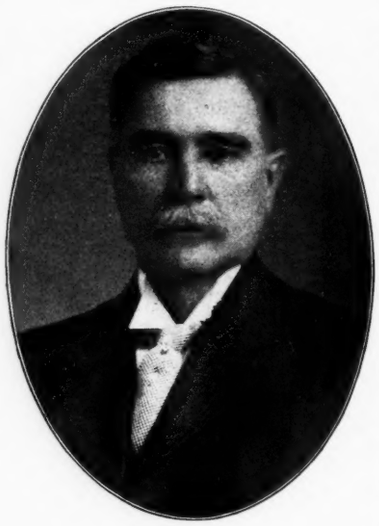
C. K. Mullings, auditor of the New Orleans Great Northern, has been appointed the assistant treasurer, with office at Bogalusa, La., succeeding J. K. Breeden, transferred.

Operating Officers.

J. B. Gilmer has been appointed the assistant to the general manager of the Texas Central, with office at Waco, Tex.

Virgil Walker has been appointed a trainmaster of the Norfolk & Southern, with jurisdiction over the Pamlico, Beaufort and Raleigh divisions and branches, succeeding M. H. McCabe, resigned.

Frank P. Brady, recently made general superintendent of the Intercolonial, and who is as well a member of the government railways managing board, was born June 22, 1853, at Haverhill, N. H. He received his education at Newburg Seminary at Newburg, Vt., and began railway work in 1869 on the Connecticut & Passumac Rivers Railroad, now the Boston & Maine. By February, 1873, he had become a train despatcher on the Northern Railroad, now part of the Grand Trunk. In August, 1880, he went to the Southeastern, now part of the Canadian Pacific, as chief despatcher at Farnham, Que., and seven years later was made trainmaster. The following year he was promoted to assistant superintendent of the Canadian Pacific at Smiths Falls, Ont. He held the office of assistant superintendent for 15 years, being transferred during that time to various divisions, and in May, 1903, he was promoted to assistant general superintendent. In September, 1908, on account of nervous breakdown he was obliged to give up all work until May of 1909, when he was appointed to his present position.



F. P. Brady.

W. F. Phillips, train despatcher of the Michigan Central, has been appointed the chief trainmaster of the Bay City division, with office at Bay City, Mich., succeeding E. L. Davis, resigned. W. H. Caldwell succeeds Mr. Phillips.

The statement, made in these columns in our issue of July 30, that A. S. Ingalls, assistant general superintendent of the Lake Shore & Michigan Southern, had been appointed the general superintendent of the Chicago, Indiana & Southern, has been officially denied.

George R. Huntington, whose appointment as the general manager of the Minneapolis, St. Paul & Sault Ste. Marie, with office at Minneapolis, Minn., has been announced in these columns, was born September 10, 1867, at New Lisbon, Wis. He received a common school education and began railway work in 1882 as a messenger on the Southern Minnesota division of the Chicago, Milwaukee & St. Paul. He was afterwards successively operator, agent and train despatcher, and in Feb-

ruary, 1888, became assistant despatcher and later chief despatcher. He was made chief clerk to the general manager in February, 1898, and the following year was appointed the superintendent of the Wisconsin division. In October, 1900, he was appointed the general superintendent of the Minneapolis, St. Paul & Sault Ste. Marie, from which position he was recently promoted to general manager.

Traffic Officers.

L. T. Swancutt has been appointed a contracting freight agent of the Illinois Central, with office at St. Louis, Mo.

B. H. White has been appointed a traveling passenger agent of the Atchison, Topeka & Santa Fe, with office at Atlanta, Ga.

Morell Law, traffic manager of the New Mexico Central, has been appointed a general agent of the Iowa Central and the Minneapolis & St. Louis, with office at Omaha, Neb.

F. G. Lyons, soliciting freight agent of the Cincinnati, New Orleans & Texas Pacific, with office at Chicago, has resigned to become the Chicago manager of J. A. & W. Bird & Co., Boston, Mass.

E. B. Leppert, district passenger agent of the Lake Erie & Western at Peoria, Ill., has been appointed a traveling passenger agent of the New York Central Lines, with office at Milwaukee, Wis., effective September 1.

H. A. Jackson, assistant general freight and passenger agent of the Great Northern at Helena, Mont., has been appointed the assistant general freight and passenger agent of the Portland district, with office at Portland, Ore.

T. H. Gillespie has been appointed a contracting freight agent of the Canadian Pacific and the Minneapolis, St. Paul & Sault Ste. Marie, with office at St. Louis, Mo., succeeding J. M. Sanford, resigned to go with another road.

E. D. Brigham, general freight agent of the Chicago & North Western at Chicago, and F. P. Eyman, an assistant general freight agent at Chicago, have both been appointed assistant freight traffic managers, with office at Chicago.

Walter Shipley has been appointed a commercial agent of the Southern Railway, with office at Houston, Tex. T. L. Langston has been appointed a soliciting freight agent, with office at Macon, Ga., succeeding D. T. Argo, assigned to other duties.

J. S. Maloney has been appointed the passenger and ticket agent of the Asherton & Gulf and J. T. Graham has been appointed the freight agent. The general offices are temporarily at Asherton Junction and later will be at Asher, Tex. See item in General News Section.

D. L. Taylor, traveling freight agent of the Piedmont Air Line, has been appointed an agent of the Eastern & Southern Despatch, with office at Boston, Mass. G. A. Reinhart, soliciting agent of the Piedmont Air Line, succeeds Mr. Taylor, with office at Boston, and R. L. Snow succeeds Mr. Reinhart, with office at Boston.

The Clyde Charleston Fast Freight Line, which operates a fast freight service over the Clyde Steamship Company's line, the Southern Railway, the Georgia Railroad, the New York, Chicago & St. Louis, etc., has established an agency at Kansas City, Mo., and L. W. Gent has been appointed the commercial agent.

L. M. Foss has been appointed a division freight agent of the Chicago Great Western, with office at Red Wing, Minn., succeeding to part of the duties heretofore performed by E. R. Beem, promoted. C. B. Fiske, division freight agent at Ft. Dodge, Iowa, has had his jurisdiction extended to include the following Chicago Great Western stations in Iowa, which were formerly located on the Waterloo, Cedar Falls & Northern: Bremner, Tripoli, Denver, Glasgow and Center.

Engineering and Rolling Stock Officers.

John Tonge, master mechanic of the Minneapolis & St. Louis at Minneapolis, Minn., has resigned, effective September 1.

The office of Joseph O. Osgood, chief engineer of the Central of New Jersey, has been transferred from Jersey City, N. J., to New York.

E. B. Van Akin has been appointed the road foreman of equipment, St. Louis division of the Chicago, Rock Island & Pacific, with office at Eldon, Mo.

P. O'Connor has been appointed an assistant roadmaster of the St. Louis Southwestern of Texas, with office at Commerce, Tex., succeeding W. F. Sparks, resigned.

H. W. Burkheimer has been appointed the master mechanic of the New Orleans Great Northern, with office at Bogalusa, La., succeeding F. Schledorn, acting master mechanic, resigned.

S. J. Johnson, bridge foreman of the Iowa Central at Oskaloosa, Ia., has been appointed the supervisor of bridges and buildings, with office at Marshalltown, Ia., succeeding J. F. Boileau, resigned.

As a further step in the advancement of the Pennsylvania's New York station extension the advisory board of engineers, having disposed of the more important questions in the development of the tunnel project, has been dissolved. The work of this board has been exceptionally interesting and important, covering many new problems connected with the building of tunnels under North and East rivers and the preparation of plans and specifications for the progress of the work, which has been the first of its character in the United States. The chairman of this board of engineers was General Charles W. Raymond. On this board with General Raymond were Charles M. Jacobs, chief engineer, North River division; Alfred Noble, chief engineer, East River division, and Geo. Gibbs, chief engineer of electric traction and station construction. With the dissolution of the board of engineers Charles M. Jacobs severs his connection with the company as chief engineer of the North River division, the work under his direction, namely, the Bergen Hill and North River tunnels up to the station site, being about completed. The chief assistant, James Forgie, remains in charge of the work to finish up any incomplete details.

C. M. Jacobs.

The completion of the two North river tunnels by Mr. Jacobs makes a record of the superintendence of construction of six complete tunnels under North river, the two Pennsylvania tunnels being the largest in size and being the first tunnels built under North river for the passage of standard railway trains into New York. Mr. Jacobs was educated in England, receiving a mechanical training in the workshops and drafting offices of the firm of Charles and William Earle, engineers and shipbuilders, Hull, England, and was finally appointed superintendent engineer in the construction of marine works; practised as consulting engineer in South Wales and London and came to the United States in 1889 by invitation of the late Austin Corbin, then president of the Philadelphia & Reading, to advise on various schemes in which that gentleman was interested, and more specially with reference to designing deep tunnels for rapid transit between Brooklyn, New York and Jersey City. He submitted plans for tunnels to run from the Battery, New York, as a center to a connection with the Long Island Railroad at Atlantic avenue in Brooklyn and the Pennsylvania Railroad at its station in Jersey City. During the period from 1890 to 1896 he was consulting engineer of the New York & New England Railroad; Elmira, Cortland & Northern; Long Island Railroad, and also chief engineer of the Blackwells Island bridge. In 1892-4, as chief engineer of the East River Gas Co., he designed and constructed a tunnel

between Ravenswood, L. I., and Seventy-first street, New York. There is laid through this tunnel two large gas mains with a 3-ft. gage railway track alongside. This tunnel was driven simultaneously from both sides of East river; the headings met at midnight, July 11, 1894, and were joined up, thus completing the pioneer tunnel under East river. Since 1902 he served as chief engineer of the North River division of the tunnel lines of the Pennsylvania, through which the enormous passenger traffic of that company will be carried in solid trains without change of cars to its terminal in New York City. In 1901 Mr. Jacobs designed and superintended the construction of a system of twin tunnels for the New York & New Jersey and the Hudson & Manhattan.

In 1907 Mr. Jacobs was engaged by the French Government to report the feasibility of constructing main line railway tunnels under the Seine between Rouen and Havre, and submitted the necessary plans together with estimates of cost. He designed and is consulting engineer for the 25-ft. 8-in. diameter tunnel now being built in Paris under the Seine to carry two lines of the Chemin de fer Metropolitan Municipal. In connection with his practice in New York, London and Paris, Mr. Jacobs is consulted on a great many questions arising in different parts of the world.

Special Officers.

H. M. Wade has been appointed the special agent, mail service, of the Erie, with office at 50 Church street, New York.

Purchasing Officers.

Frank Duggan, storekeeper at the Paducah, Ky., shops of the Illinois Central, has been transferred to East St. Louis, Ill. Bell Given succeeds Mr. Duggan.

W. J. Turner, chief clerk to the assistant storekeeper of the Chicago, Burlington & Quincy, has been appointed the inspector of stores, with office at Chicago, succeeding J. G. Stuart, promoted.

T. A. Fay, assistant general storekeeper of the Chicago, Burlington & Quincy at Chicago, has been appointed the general storekeeper, with office at Chicago, succeeding T. J. Frier, resigned. J. G. Stuart, inspector of stores, succeeds Mr. Fay.

OBITUARY.

Charles M. Bissell died at his summer home in Gloucester, Mass., on August 6. In 1888 Mr. Bissell was superintendent of the Eastern division of the New York Central & Hudson River and was a superintendent of the New York Central until 1891. At the time of his death he was state fiscal supervisor of charities.

A. E. Welby, first vice-president and general manager of the Denver, Laramie & Northwestern, died at Denver on August 8. Mr. Welby was born in 1855 at Georgetown, South Africa, and received his education at the Portora Royal School, Enniskillen, Ireland, and the Royal Naval Academy, Gosport, England. He began railway work in 1872 as rodman on the Great Western of Canada, now a part of the Grand Trunk, and later held various positions in the operating department. In 1876 he went into the office of the chief engineer of the Canada Southern, now a part of the Michigan Central, and in August, 1877, was made a freight clerk on the Grand Trunk, two years later becoming clerk to the superintendent. In 1881 he went to the Denver & Rio Grande as clerk to the division superintendent and in 1883 was promoted to chief clerk to the general superintendent. He was appointed chief clerk in the general manager's office in 1887 and three years later was appointed superintendent of the Rio Grande Western. In 1892 he was promoted to general superintendent, and later in the same year went to Lima, Peru, as general manager of the Cerro De Pasco railroad. In 1904 he returned to the Rio Grande Western as general superintendent and in 1906 was made general superintendent of the Denver & Rio Grande System. In April, 1908, he was made general superintendent of the Colorado and the New Mexico lines of the Denver & Rio Grande, and in September, 1908, was elected first vice-president and general manager of the Denver, Laramie & Northwestern, in charge of construction and operation, which position he held until his death.

Railroad Construction.

New Incorporations, Surveys, Etc.

Buffalo Frontier Terminal.—See Frontier & Western.

Canadian Pacific.—An officer writes that nothing definite has been decided on in connection with the proposed extension from Kootenai Landing, B. C., north to Proctor, 33 miles.

A contract is said to have been given to Dixon & Moore for building seven miles of the Alberni, B. C., extension on the Esquimalt & Nanaimo.

Chicago & North Western.—Plans are being made for getting charters in South Dakota for building during the next three or four years a number of branch lines in that state to open up wheat land. Subsidiary companies are to be formed to build the lines, the North Western later leasing them.

The Milwaukee, Sparta & North Western has been incorporated in Illinois, with $25,000 capital, to build 53 miles of line through Milwaukee, Waukesha and Dodge counties, Wis., from a connection with the Chicago & North Western near Lindwerm, west, thence north to Clyman, also from the same road near West Allis northwest to Clyman. The incorporators include M. Hughitt and J. M. Whitman, of Chicago; W. A. Gardner, R. H. Aishton and M. M. Kirkman, of Evanston; J. F. Cleveland and W. H. Stennert, of Oak Park.

Chicago, Burlington & Quincy.—According to press reports a contract has been given to Gibbons & Keefe, of Salt Lake City, Utah, for building about a mile of roadbed through the canyon of the Big Horn, including a long tunnel on the extension under construction from Kirby, Wyo., south to Shoshoni. (July 23, p. 167.)

Copper River & Northwestern.—According to press reports about 4,000 men are now at work on the construction of this line, building from Cordova north to Bonanza, about 160 miles. The principal work carried out this summer was the erection of steel bridges replacing temporary pile structures. A steel span of 560 ft. has been put in place and another to be put up will be about 760 ft. long. A cantilever bridge 1,800 ft. long is to be built over the channel of the Copper river between Miles and Childs glaciers, to cost about $1,000,000. A mortgage securing $50,000,000 fifty-year 5 per cent. bonds has been made to carry on the work. The line is now running from Cordova, Alaska, inland about 53 miles. M. J. Heney, 514 Coleman building, Seattle, Wash., is building the line. (April 30, p. 960.)

Des Chutes Railroad.—See Union Pacific.

Enid & Central Traction.—Incorporated in Oklahoma, with $1,000,000 capital and office at Enid, to build from Enid, Okla., south, paralleling the Chicago, Rock Island & Pacific, to El Reno, about 65 miles. The estimated cost of the line is $1,000,000. It is ultimately intended to extend southwest from El Reno to Lawton, 70 miles, and build other extensions as follows: From the Enid-El Reno line east via Crescent to Guthrie, 25 miles; Enid north via Pond Creek to Medford, thence east to Blackwell, 55 miles. The incorporators include: W. H. Stewart, R. W. Whittinghill and C. E. Burkhart, of Enid; W. F. McMahon, O. W. T. McMahon and J. W. Smith, of Toledo, Ohio. It is proposed to begin construction work about September 1.

Florida Roads.—J. B. Taylor & Co., 30 Church street, New York, have been given a contract to build 45 miles of line from Sanford, Fla., via Orlando to Kissimmee, and are in the market for 4,000 tons of No. 1, Hunt's inspection, relay rails, to be delivered at Sanford, on the St. Johns river; they also want to hear from the owner of a track laying machine near that place.

Fort Smith, St. Louis & Chicago.—Incorporated in Arkansas, with $2,500,000 capital, by New York and Philadelphia capitalists, to build from Harrison, Ark., in Boone county, southwest via Jasper, Parthenon, Catalpa, Oark and Yale to Mulberry, about 98 miles, traversing a timber and mineral section. Senator S. Roland, of Harrison, is attorney for the company.

FRANKLIN & ABBEVILLE.—Bids are wanted at the office of the company in New Orleans, La., August 16, for an extension to be known as the Youngsville-Vermillion river branch. (March 19, p. 654.)

FRANKLIN & CLEARFIELD.—See Lake Shore & Michigan Southern.

FRONTIER & WESTERN.—Incorporated in New York, with $500,000 capital, to build a line in Buffalo from Tonawanda to Parish and Dearborn streets, as an addition to the Buffalo Frontier Terminal, organized to build a freight belt line around Buffalo to provide transportation facilities with the International bridge at Black Rock. C. W. Goodyear, president; E. Michael, vice-president; A. D. Bissell, treasurer; R. F. Schelling, secretary, of Buffalo. (July 30, p. 215.)

GRAND TRUNK PACIFIC.—This company will begin work at once, it is said, on a branch from Justice, Man., southeast to Brandon, 18 miles. It is expected that the line will be put in operation this year.

Contract is said to have been let to J. D. McArthur, Winnipeg, for a branch from Tofield, Alb., south to Calgary, about 200 miles.

KANSAS-COLORADO ELECTRIC.—The Kansas-Colorado Construction Company has been organized in Colorado, with $250,000 capital and offices at Lawrence, Colo., and Pueblo. The company plans to begin work within 60 days, or as soon as the franchise now pending before the Pueblo City Council is granted. It is expected that the line will be put in operation from Pueblo west to coal fields in Fremont county by June, 1910. R. C. Johnston is secretary and manager of the construction company and secretary of the railway company, Pueblo. (March 19, p. 655.)

LAKE SHORE & MICHIGAN SOUTHERN.—According to press reports the Franklin & Clearfield, building through the coal fields of Pennsylvania from Franklin, Pa., southeast to Brookville, 62 miles, thence to Clearfield, a total of 110 miles, has been finished from Franklin to Brookville. Arrangements are said to have been made with the Pennsylvania for trackage over that road to a point near Dubois, Pa. It is understood that large classification yards and shops are to be put up between Brookville and Dubois. (March 19, p. 655.)

LOUISVILLE & EASTERN (ELECTRIC).—An officer writes that contract has been given to Charles Christopher for completing the Shelbyville extension from Beechwood, Ky., east to Shelbyville, 23 miles. The work includes track laying, ballasting, surfacing, building three frame stations and two brick sub-stations, 40 shelter houses and platforms and overhead line work. The work is to be finished by February, 1910. Sub-contracts lelt to W. J. McClusky and W. P. Adams. In 1907 grading, bridging and trestling was finished and five and one-quarter miles of track was laid. J. B. Walker, chief engineer, Louisville.

MARSHALL & EAST TEXAS.—Contract is said to have been given to Kaiser & Maloney for an additional six miles on the extension of this road from Marshall, Tex., south. This work carries the line south into Panola county. (June 11, p. 1230.)

MEXICAN SOUTHERN.—An officer writes that work is now under way on a branch from San Pablo, Oaxaca, on the southern end, to Taviche. (July 23, p. 168.)

MEXICO & NORTHWESTERN.—This company has secured control of the Rio Grande, Sierra Madre & Pacific, operating a line from El Paso, Tex., southwest to Terrazas, Mex., about 160 miles. The new owners propose to build 160 miles to a connection with the Sierra Madre & Pacific and the Chihuahua & Pacific, which will provide the Mexico & Northwestern with an outlet for its timber through Chihuahua over the Mexican Central as well as over its own line through El Paso. The New York office of the company is at 25 Broad street. (See mention of this road under Railroad Financial News.)

MILWAUKEE, SPARTA & NORTH WESTERN.—See Chicago & North Western.

MISSOURI, OKLAHOMA & GULF.—The line from Okmulgee, Okla., to Allen has been completed and train service begun. The final survey to Denison, Tex., has been made and work is under way.

NORTHERN PACIFIC.—According to press reports surveys are being made for a 20-mile cut-off from the eastern terminus of the branch at Grand View, Wash., east, passing through the Prosser district about a mile north of Prosser to Gibbon on the main line, six miles east of Prosser.

OHIO VALLEY TRACTION.—Incorporated in Illinois, with $10,000 capital and office at Brockport, to build from near Golconda, Ill., westerly via Brockport to Joppa, about 35 miles. The incorporators are: O. H. Margrave, G. W. Tucker, W. Pell, H. W. Holifield and W. D. Harrington, all of Brockport; R. C. Leeper and C. Webb, of Unionville, Ill., and C. L. Robertson, of Paducah, Ky.

OREGON SHORT LINE.—An officer writes that it is proposed to construct 16.3 miles of the eastbound main track on the new three-track roadbed, built jointly with the Western Pacific, from a connection with the present main track just east of Deeth, Nev., to a connection with the present main track west of Wells. It is also proposed to construct three passing tracks, one to be 8,649 ft. long and the other two each 3,300 ft. long. The present plans provide for the abandonment of the present main track between these two places as soon as the new line is put in service.

According to press reports the Utah & Idaho has been organized in Utah, with a capital of $160,000 and headquarters in Salt Lake City, to build from a point on the Ogden-Lucin cut-off near Saline north and northwesterly to the Southern Pacific near Monument, thence northerly through Kelton Pass to the Idaho state line and northwest along the drainage of Raft river and tributaries to a connection with the Minidoka & Southwestern, near Burley, Idaho, 150 miles, traversing Box Elder county, Utah and Cassia county, Idaho. It has not been decided whether steam or electricity will be used for the motive power. W. H. Bancroft, president; D. E. Burley, vice-president; C. H. Jenkinson, treasurer, and G. J. Smith, secretary.

PENNSYLVANIA LINES WEST.—Work on important double-tracking and grade revision has just been started, including double-tracking 99 miles between Horatio, Pa., and Onward. This improvement will involve 1,500,000 cu. yds. of excavation, the installation of 25,000 yds. of masonry and the removal of 20 grade crossings. It will also call for the elimination of all facing point switches on this part of the line except those which are interlocked. The maximum grade on this line is 0.5 per cent.; it is designed to decrease this to 0.3 of 1 per cent. These improvements have been rendered necessary by the development of the steel plant at Gary, Ind., where a very large amount of coal and coke from the West Virginia coal fields is used. The cost will be about $3,000,000. Grading is to be pushed as rapidly as possible and it is expected that the tracks will be in use by the summer of 1910. The completion of this work will provide an alternative double-track road between Pittsburgh and Chicago, as the entire line is already double-tracked except between these two points and about six miles through Piqua, Ohio.

The 63 miles between Richmond, Ind., and Irvington are to be double-tracked and all grades reduced to a maximum of 0.7 per cent., at an estimated cost of $4,000,000. Contracts have been let for two sections covering the 17 miles between Richmond and Dublin. The work involves the excavation of 1,187,000 yds. of earth, the elimination of 20 highway grade crossings and the installation of 46,500 yds. of masonry. On the seven miles between Dunreith and Knightstown 513,200 yds. of excavation will be taken out and 23,300 yds. of masonry will be installed, eliminating 11 highway grade crossings. It is planned to raise the grade at Cambridge City about 27 ft. in order to separate the crossings of the Pennsylvania Lines with the Big Four and the Lake Erie & Western. The Cambridge City branch will be abandoned between Cambridge City and Bentonville, 6.2 miles, and a new line built from Bentonville to a connection with the main line at Dublin, five miles, to reduce the ruling southbound grade of the branch. Except for six miles through Piqua and 31 miles between Bradford and New Paris this work between Richmond and Irvington will complete the double-tracking between

Pittsburgh and Indianapolis. Between Indianapolis and St. Louis there are now 36 miles of double track so that of the total 1,060 miles between New York and St. Louis 817 miles will have from two to six tracks.

Pittsburgh & Lake Erie.—According to press despatches, surveys are being made for a line from Ellwood City, Pa., on the Pittsburgh & Lake Erie, to Stoneboro, on the Franklin & Clearfield.

Rio Grande, Sierra Madre & Pacific.—See Mexico & Northwestern.

St. Louis, Oklahoma & Gulf.—An officer writes that the company wants to hear from contractors to begin work within 30 days and finish 75 miles of line from Mineola, Tex., north to Paris. The work includes grading, bridging and track laying, no rock work, some light cuts and fills, and three pile trestles, of 900 ft., 1,200 ft. and about 700 ft., respectively. M. J. Healy, president, Tyler, Tex. (July 16, p. 26.)

Southern Pacific.—Contract is said to have been let recently to the Utah Construction Co., at about $2,500,000, for work on the first 25 miles of the Oregon Eastern, from Natron, Ore., south. Additional contracts are to be let for nine miles more on this end of the line, also for about 25 miles from the proposed southern terminus at Klamath Falls north. (July 9, p. 79.)

Spokane & South Western.—Incorporated in the state of Washington, with $5,000,000 capital, to build from Spokane, southerly through the states of Washington, Oregon, Idaho, Nevada and California. The incorporators are: C. A. Mussgane, D. Van Orsdale, M. Michner, E. A. Patrick and E. S. Blair, all of Spokane.

Union Pacific.—The Des Chutes Railroad is building in Oregon from the Oregon Railroad & Navigation Company, at a point near Des Chutes river, Ore., south to the mouth of Trout creek, 83 miles, thence via the Agency Plains country and Madras, in Crook county, to the proposed terminus at Redmond, which is 130 miles south of Des Chutes. The maximum grade on the first 83 miles is to be $^{8}/_{10}$ per cent. from that point to mile 100, $1^{5}/_{10}$ per cent., and from mile 100 to Redmond $^{5}/_{10}$ per cent., with 10 deg. of curvature, and in two or three instances 17 deg., to avoid tunneling at various points at the present time. The canyon through which the line is to be built passes cliffs rising in many places from the river about 2,000 ft. There will be six tunnels varying in length from 500 ft. to 1,000 ft., and three viaducts, one crossing Trout creek, to be 100 ft. high and 510 ft. long; another over Willow creek is to be 264 ft. high and 1,070 ft. long, and the third over Crooked river is to be 302 ft. high and 360 ft. long. Construction work was started July 8 and will be pushed to completion. Up to August 1 about 45 miles of the line was covered with construction outfits, and it is planned to cover the entire line as rapidly as possible to have it finished and in operation at an early date.

Utah & Idaho.—See Oregon Short Line.

Washington Roads.—The Superior Coal Company has bought right-of-way and expects to begin work at once on a three-mile line in King county from its mines to a connection with the Northern Pacific at Issaquah, Wash. Wm. Beresford, Kavanagh, is president.

Western & Atlantic.—A committee of the Georgia legislature has estimated that an extension from Atlanta to the sea would cost the state $36,650 a mile, and that by using convict labor this could be reduced to $31,650 a mile.

Western Pacific.—An officer writes that track is laid through both the Spring Garden and Beckwith tunnels crossing the Nevada mountains into California and the tunnels are connected with each other. There remains about 160 miles of track yet to be laid to finish the line from Salt Lake City, Utah, west to Oakland, Cal., 923.7 miles. This work is under way from four different points, and it is expected to have the track laying finished early in October. (July 2, p. 35.)

According to press reports train service has been extended from Shafter, Nev., west to Elko, 262 miles west of Salt Lake City, Utah. (July 2, p. 39.)

Railroad Financial News.

Buffalo, Lockport & Rochester.—The United States Circuit Court on August 5 appointed John M. Campbell and Milford W. Childs receivers. The company acknowledged its insolvency and the interest due August 1 on the $3,400,000 first mortgage bonds remains unpaid. The company operates about 55 miles of interurban line between Rochester, N. Y., and Lockport, and has besides the first mortgage bonds, $2,348,800 stock outstanding.

Canadian Pacific.—This company, it is understood, has agreed to guarantee interest at the rate of 4½ per cent. on bonds of the Aroostook Valley railway, which is to build an electric line down into the territory of the Bangor & Aroostook. The charter of the Bangor & Aroostook prevents the building of steam lines in its territory.

Chicago Great Western.—See Waterloo, Cedar Falls & Northern.

Cornwall & Lebanon.—A 5 per cent. semi-annual dividend has been declared on the $800,000 capital stock payable July 31. This makes, together with the 3 per cent. paid last February, 8 per cent. in dividends in 1909 as compared with 7 per cent. in 1908, 8 per cent. in 1907 and 6 per cent. yearly from 1902 to 1906.

Genessee & Wyoming.—W. H. Barnard has been elected a director, succeeding E. L. Fuller, deceased. The road runs from Reslof, N. Y., to Pittsburgh & Lehigh Junction, with branches; total 16 miles.

Mexico & Northwestern.—This company has bought the entire capital stock and outstanding bonds of the Rio Grande, Sierra Madre & Pacific, whose road runs from El Paso, Tex., to Terrazas, Chih., Mex. By building 160 miles of line between a connection with this newly acquired road and the Chihuahua & Pacific, which was bought some time ago, the Mexico Northwestern could get an outlet for its timber to Chihuahua on the Mexican Central as well as through El Paso, Tex., on its own lines.

Missouri Pacific.—Stockholders have voted to consolidate the various companies forming the Missouri Pacific system, exclusive of the St. Louis, Iron Mountain & Southern. Eleven corporations are to be taken over by the new Missouri Pacific Railway. (June 11, p. 1230.) The new corporation is to have a capital of $240,000,000. The capital of the present Missouri Pacific is $77,817,875 and the total authorized capital of the absorbed companies is $162,000,000, of which $132,000,000 is owned by the Missouri Pacific and $25,000,000 is unissued. About $83,000,000 stock will be issued at once in exchange for outstanding stock of the old company and the lines absorbed, but no stock will be issued for stock of the absorbed company already held in the Missouri Pacific treasury. The *Commercial and Financial Chronicle* says: "The necessary 60 days' notice will at once be given, calling a meeting to authorize a new mortgage. The mortgage will be for $150,000,000 to $175,000,000, of which about $86,000,000 will be for refunding purposes. A sale has been arranged, it is understood, of a block of the bonds when issued to Kuhn, Loeb & Co., New York."

Waterloo, Cedar Falls & Northern.—The lease of the line of the Chicago Great Western between Sumner, Iowa, and Waverly to the Waterloo, Cedar Falls & Northern has been terminated and the receivers of the Chicago Great Western have taken possession. The Waterloo, Cedar Falls & Northern has leased to the receiver of the Chicago Great Western the right to operate the freight business on their line between Waterloo, Iowa, and Denver Junction.

The French Chamber has by a great majority passed a law which authorizes the administration, in case of a strike like that of the Marseilles sailors, to suspend the maritime laws and permit foreign vessels to carry traffic between France and Algeria, Tunis and Corsica. During this last strike flour became so scarce in Corsica that it rose greatly in price, and 240,000 Algerian sheep intended for the Paris slaughter houses were kept back.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Gallatin Valley Railway has ordered one locomotive from the Baldwin Locomotive Works.

The St. Johns River Terminal Co. has ordered one locomotive from the Baldwin Locomotive Works.

The San Diego & Arizona has ordered one six-wheel switch engine from the American Locomotive Co.

The Lake Superior & Ishpeming is said to have ordered seven locomotives. This is not confirmed.

The Duluth, South Shore & Atlantic has ordered one locomotive from the Baldwin Locomotive Works.

The Chesapeake & Western has ordered one consolidation locomotive from the American Locomotive Co.

The Norfolk & Western is said to be in the market for six Pacific type locomotives. This item is not yet confirmed.

The Patagonian Railways, as reported in the *Railroad Age Gazette* of July 23, are asking bids on seven 4-8-0 locomotives.

The Northern Pacific is said to have ordered 17 passenger locomotives from the Baldwin Locomotive Works. This item is not yet confirmed.

The Chicago, Burlington & Quincy is said to have ordered five freight locomotives from the Baldwin Locomotive Works. This item is not yet confirmed.

The Monongahela Railroad is in the market for four consolidation engines. This is the equipment mentioned in the *Railroad Age Gazette* of July 2.

The North Coast Railroad, Spokane, Wash., has ordered for immediate delivery for construction work in Washington two 80-ton consolidation locomotives from the American Locomotive Co.

The Great Northern has ordered from the Baldwin Locomotive Works 25 passenger locomotives, and is said to have ordered from the same company 10 freight engines, but this latter is not yet confirmed.

CAR BUILDING.

The Hastings Express Co. will buy four express cars.

The Kansas City Railway & Light is in the market for 25 cars.

The Illinois Tunnel Co., Chicago, is preparing specifications on 1,000 all-steel, narrow gage freight cars for use in its freight tunnels.

The Northern Texas Traction Co., it is said, will put 10 pay-as-you-enter cars in service on its Fort Worth line. This is not yet confirmed.

The Gulf, Sabine & Red River, a logging road at Fields, La., has ordered 20 standard gage logging cars from the Orange Iron Works.

The Chicago & Alton has ordered four baggage cars from the Barney & Smith Car Co. and three chair cars from the American Car & Foundry Co.

The Chicago, Rock Island & Pacific is asking prices on 2,000 forty-ton, common standard, steel underframe cars, 1,000 of which are to be box and 1,000 furniture.

The Pennsylvania has ordered for the Lines West 2,000 fifty-ton steel coke cars from the Standard Steel Car Co. and 600 similar cars from the Cambria Steel Co.

The Chicago & North Western has ordered from the American Car & Foundry Co. the 1,500 steel underframe gondolas mentioned in the *Railroad Age Gazette* of July 23.

The Augusta Railway & Electric Co., Augusta, Ga., is said to have ordered from the St. Louis Car Co. six semi-convertible, single-truck cars 21 ft. long. This is not yet confirmed.

The Baltimore & Ohio has ordered from the Standard Steel Car Co. 1,000 coke cars, 1,000 gondola and 600 hopper cars. This equipment is part of that mentioned in the *Railroad Age Gazette* of July 23.

The Baltimore & Ohio has ordered the 70 passenger train cars mentioned in the *Railroad Age Gazette* of July 23. It is understood that the order was divided between the Barney & Smith Car Co. and the American Car & Foundry Co.

The Detroit United Railways, Detroit, Mich., divided the order for 50 cars mentioned in the *Railroad Age Gazette* of July 16, 25 cars going to the G. C. Kuhlman Car Co. and 25 to the Cincinnati Car Co.

The Chesapeake & Ohio has ordered 500 additional hopper cars from the Standard Steel Car Co., making a total of 2,000 hopper cars ordered from this company during the spring and summer of the current year.

The Houston Electric Co., Houston, Tex., has ordered 10 cars from the Cincinnati Car Co. in addition to the 20 cars mentioned in the *Railroad Age Gazette* of June 11. The entire order is to be delivered between August 15 and September 15.

The Canadian Northern, as reported in the *Railroad Age Gazette* of July 23, has ordered 15 eight-wheel cabooses from the Crossen Car Manufacturing Co., three 12-section sleeping cars from the Barney & Smith Car Co. and 100 flat cars from the Dominion Car & Foundry Co. The flat cars were ordered last May, the others were ordered in the middle of July. The cabooses will be of 20 tons capacity and will measure 30 ft. long, 8 ft. 6 in. wide and 6 ft. 6 in. high, inside, and 35 ft. long, 9 ft. 9½ in. wide and 16 ft. 6½ in. high, over all. Bodies and underframes will be of wood. Delivery is for September, 1909. The special equipment includes:

Axles	M. C. B.
Bolsters, body	Wood
Bolsters, truck	Wood
Brakes	Piped
Brake-beams	Wood
Brake-shoes	Steel back
Brasses	Canadian bronze
Couplers	R. E. Janney
Draft gear	Lugs
Dust guards	Wood
Heating system	Stove
Journal boxes	McCord
Lighting system	Oil
Platforms	Mineral
Roofs	Pioneer Plastic
Seats	4 bunk seats
Seat covering	Pantasote
Side bearings	Roller
Springs	M. C. B.
Trucks	Swing bolster
Wheels	600-lbs. 33-in.

The sleeping cars will measure 72 ft. 6 in. long over end sills. Bodies and underframes will be of wood. Delivery is for September 30. The special equipment includes:

Axles	4¼ in. x 8 in., M. C. B.
Bolsters, body	Iron
Bolsters, truck	Pullman
Brakes	Westinghouse
Brake-beams	Dayton
Brake-shoes	Steel back
Brasses	M. C. B.
Couplers	Chicago
Curtain fixtures	B. & S.
Curtain material	Pantasote
Draft gear	Miner
Dust guards	Wood
Heating system	Gold
Journal boxes	McCord
Lighting system	Commercial Acetylene Co.
Paint	Pullman
Platforms	Pullman
Seat covering	Plush
Side bearings	B. & S.
Springs	M. C. B.
Trucks	Pullman style
Ventilators	Arnoldi
Vestibules	Wide
Vestibule diaphragms	Ajax
Vestibule trap doors	Steel
Wheels	36-in. steel tire
Window fixtures	Edwards

The Atchison, Topeka & Santa Fe has ordered the following passenger equipment: Seven composite cars, buffet and bag-

gage; 1 cafe observation, 4 diners, 10 postal, 10 smokers, 7 Jim Crow cars, 3 combination chair and smoking cars, 20 coaches and 28 chair cars. This is in addition to the 6 coaches and 50 baggage cars previously reported. The baggage and postal cars are to be built by the American Car & Foundry Co. and the rest by the Pullman Company.

The Canadian Pacific, as reported in the *Railroad Age Gazette* of July 23, has ordered from its Angus shops 102 box cars, one box-baggage car, five freight refrigerator cars, one stock car and 15 flat cars; from the Dominion Car & Foundry Co., 125 steel 40-ton flat cars, three steel 50-ton coal cars, and from its Farnham shops one van. The specifications are the same as for cars of these types ordered last spring, with the following additions: The box-baggage car will be similar to a box car, except that it will have side doors of the refrigerator car type and steel-tired wheels, with steam pipe and air signal pipe underneath the car so that it can be run in passenger service. The steel coal cars will be 36 ft. 9½ in. long, 5 ft. high and 9 ft. 6 in. wide, inside measurements, and 38 ft. 10 in. long and 10 ft. ½ in. wide over all. Metalistic paint will be used. The steel flat cars will be 42 ft. 2 in. long over buffer blocks, 9 ft. wide over frame and 4 ft. 2⅛ in. high over all. The body bolsters will be built into the frame of the car.

The Alabama Great Southern, as mentioned in the *Railroad Age Gazette* of July 9, has ordered 200 flat cars from the Pressed Steel Car Co. and 250 hopper bottom and 375 drop bottom gondolas from the Standard Steel Car Co., all for delivery in three months. All of these cars have steel bodies and underframes and are of 100,000 lbs. capacity. The flat cars are 40 ft. long and 9 ft. wide. The hopper bottom gondolas are 30 ft. long, 9 ft. 6 in. wide, 6 ft. 5½ in. high, inside measurements, and 31 ft. 10 in. long and 10 ft. ⅜ in. wide, over all. The drop bottom gondolas are 41 ft. 9 in. long, 9 ft. 4⅞ in. wide, inside, and 42 ft. 6 in. long and 9 ft. 11⅞ in. wide, over all. The special equipment for all cars is as follows:

Axles	Open-hearth steel
Bolsters	Steel
Brakes	Westinghouse
Brake-beams	I-beams, railway standard
Brake-shoes	M. C. B.
Brasses	Ajax metal
Couplers	Climax, 5 x 7, steel
Doors	Drop (gondolas only)
Draft gear	Miner tandem
Dust guards	Harrison
Journal boxes	Franklin
Paint	Lowe Bros.
Side bearings	Woods
Springs	Harvey and Ry. Steel-Spring Co.
Trucks	Buckeye, cast steel
Wheels	33-in. cast iron, 715 lbs.

IRON AND STEEL.

The Baltimore & Ohio is in the market for 7,000 tons of rails.

The Chicago, Burlington & Quincy is making inquiries for 20,000 tons of rails.

The Atlantic Coast Line is said to have ordered 3,500 tons of rails from the Pennsylvania Steel Co.

J. B. Taylor & Co., New York, are in the market for 4,000 tons of No. 1, Hunt's inspection, relaying rails for a road being built in Florida.

The Harriman Lines have ordered 500 tons of rails from the Illinois Steel Co. in addition to the large orders mentioned in the *Railroad Age Gazette* of July 2.

General Conditions in Steel.—The demand for steel continues active, helped by large orders for steel cars recently placed and the rail requirements still on the market. Many plans for extensions of steel plants have come out recently, these being in addition to work already under way. The Steel Corporation is operating at about 92 per cent. of its blast furnace capacity, the highest since October, 1907. The American Bridge Co. is running at about 80 per cent. of normal, being unable to get enough raw material; it has orders on its books for about three months' output.

RAILROAD STRUCTURES.

Aroostook Junction, N. B.—Bids, it is said, will shortly be asked for by the Canadian Pacific for a roundhouse, turntable and pit, to cost about $75,000.

Brainerd, Minn.—The Northern Pacific is to build a large foundry to be operated in connection with its other shops.

Cleveland, Ohio.—The Baltimore & Ohio has given contracts to Charles A. Sims & Company, of Philadelphia, for the substructure, and to the Pennsylvania Steel Company, of Steelton, Pa., for the superstructure of a double-track Scherzer rolling lift bridge over the Cuyahoga river, to cost about $275,000. It will be of the single lift type, 200 ft. long to center of bearings, and will have two deck plate girder approach spans, 43 ft. long. The superstructure will weigh about 1,100 tons and is to be supported on a pile foundation with concrete piers and abutments. The bridge will replace a swing drawbridge.

Cordova, Alaska.—See Copper River & Northwestern under Railroad Construction.

Dayton, Ohio.—It is reported work will be started at once on a new freight depot.

Deschutes, Ore.—See Union Pacific under Railroad Construction.

Edmonton, Alb.—A contract is said to have been given by the Grand Trunk Pacific to the Carter-Halls-Aldinger Company, of Winnipeg, Man., and Chicago, for a roundhouse, also a machine shop, to cost $75,000.

Hazelton, Ohio.—According to press reports it has been decided to abandon the Pittsburgh & Lake Erie shops at McKee's Rocks, Pa., and establish new ones at Hazelton near Youngstown, Ohio.

Johnstown, Pa.—Bids are being received, it is said, by the Pennsylvania for putting up a viaduct at Johnstown.

Kansas City, Mo.—The city council has passed an ordinance submitting to a vote of the people on September 8 the ordinance providing for the construction of a new union passenger station and new passenger freight terminals.

Little Rock, Ark.—The new union station is to be opened in a short time. A force of 250 men is now at work on the yard tracks and platforms.

Paris, Tex.—The state railway commission is preparing plans for a Frisco-Santa Fe union station.

Portland, Ore.—Western papers are quoting the assistant general passenger agent of the Northern Pacific as authority for the statement that the company is to build large tourist hotels at Portland, Seattle, Wash., Spokane and Tacoma.

Rob Roy, Ark.—The St. Louis Southwestern has let the contract for rebuilding its bridge, mentioned in the *Railroad Age Gazette* of July 30, to the Missouri Valley Bridge & Iron Co. The work will cost $350,000. It is said that the same company has let a contract for a steel bridge over the Saline river near Pine Bluff, to cost about $150,000. Extensive ballasting is also understood to be under way on the Arkansas lines.

Tacoma, Wash.—A contract has been let for a station to be used jointly by the Northern Pacific and the Great Northern.

Tulsa, Okla.—The St. Louis & San Francisco will build a roundhouse.

Vancouver, B. C.—According to press reports negotiations are pending between the Great Northern and the city officials for the improvement of False Creek. Plans have been made for the construction of passenger and freight stations and securing facilities for deep-water shipping. The cost of the improvements will be $1,000,000 and work is to be started within 60 days.

Walnut Springs, Tex.—The Texas Central is planning to build a 10-stall roundhouse. The building will be 71 ft. deep and 260 ft. long on the back line. Construction is to begin in about two months.

Supply Trade News.

The Pullman Company, Chicago, is asking prices on structural steel for an addition to its plant. About 7,500 tons of steel will be required.

The Mt. Vernon Car Manufacturing Co. will build a new steel freight car plant adjoining its present plant in Mt. Vernon, Ill., to cost about $500,000.

F. G. Lyons, soliciting freight agent of the Cincinnati, New Orleans & Texas Pacific, has been appointed Chicago manager of J. A. & W. Bird & Co., Boston, Mass.

The Gold Car Heating & Lighting Co., New York, has received orders for the heating apparatus on the 70 passenger cars recently ordered by the Baltimore & Ohio.

Burton W. Mudge & Co., Inc., has been organized in Chicago to manufacture railway supplies. The capital is given as $50,000. The incorporators are B. W. Mudge, C. C. Roe and E. C. Wood.

F. L. Whitcomb, formerly general sales agent of the Griffin Wheel Co., Chicago, has been elected a vice-president of that company. C. K. Knickerbocker succeeds Mr. Whitcomb as general sales agent.

The Vulcan Iron Works, Wilkesbarre, Pa., is building a four-wheel locomotive with two-wheel leading truck and eight-wheel separate tender, 36-in. gage, for the Farmer's Manufacturing Co., Norfolk, Va.

The Solid Steel Car Wheel Co., Chicago, is said to be figuring on a plant at Racine, Wis., for the manufacture of forged steel car wheels. The required capital for the plant is $140,000. J. H. Shirley is interested.

W. E. Ballantine, formerly chief electrician of the Chicago, Rock Island & Pacific, has gone to the Willard Storage Battery Co., Cleveland, Ohio, as manager of western railway sales, with headquarters at Chicago.

The Joliet Steel Car Manufacturing Co., Joliet, Ill., has purchased 60 acres of land, upon which to erect a repair plant for steel cars. Plans for the buildings are nearly completed and work will begin in the near future.

The Hurley Track Laying Machine Co., Chicago, has leased one of its machines to the Manistee & North Eastern to lay an extension in Michigan. The machine, with 28 Italians, is laying and quarter-spiking one mile of track per day and at times, with its own power, hauls a material train of 14 cars up a 6 per cent. grade on a rough roadbed.

The Whipple Car Co., Commercial National Bank building, Chicago, has acquired the property and business of the Chicago, New York & Boston Refrigerator Co., and will hereafter conduct the car building and mechanical departments of that business under the name of the Whipple Car Co., assuming all obligations of the old company. There is to be no change in officers.

J. A. Gearhart, material inspector in charge of the Pittsburgh district of the Pennsylvania Railroad, has gone to the Gulick-Henderson Co., Pittsburgh, Pa., as manager of the inspection department. Mr. Gearhart has been in the employ of the Pennsylvania ever since he left school, and previous to his services in charge of the Pittsburgh inspection department, he was in charge of the material inspection department in Philadelphia.

The International Correspondence Schools, Scranton, Pa., reports that during the year 1908 there were 922,000 recitations by students, and in the railway department during June 234 instructions on locomotives and air brakes were given, at which there was an attendance of 5,642 employees. The company is mailing printed postal cards to railway officials to interest them in this work.

The Chinese government has ordered from the Western Electric Co., Chicago, a complete common battery telephone plant for Pekin. Heretofore there have been telephones in only a few Chinese cities, and these largely in the foreign quarters, which were served by small out-of-date systems. The two switchboards sold by the Western Electric Co. to the government are the first common battery boards in the entire empire. The order amounts to about $150,000 and covers a complete plant, including several hundred thousand feet of lead-covered aerial and underground cable. The contract calls for complete delivery at Tientsin by February 3, 1910.

TRADE PUBLICATIONS.

Chicago, Milwaukee & Puget Sound.—A folder has been issued announcing the completion of this road to the coast. A picture of the laying of the last rail, a list of the stations on the road and a large map of the territory through which the road runs are included.

Denver & Rio Grande.—A pamphlet that will be of interest to those contemplating an outing in the Rocky Mountain region is Stanley Wood's "With Nature in Colorado," published by the Denver & Rio Grande. The illustrations, of which there are many, harmonize with the title and text.

Missouri Pacific.—"Colorado" is the title of a new tourists' booklet of 45 pages and 47 photographs describing the mountain scenery and a few of the cities along the company's line. A small pamphlet on "Nearby Woods and Streams" issued by the same company tells of the fishing, hunting and recreation to be found on the White and James rivers in the Ozark mountains.

Great Northern.—A booklet, "Where to Cast," is devoted to "summer outings for the angler and vacationist." Another pamphlet by the same company has been published on the Seventeenth National Irrigation Congress. It is somewhat similar to the one issued on the same subject several weeks ago, but is given over mainly to photographs of the irrigated district, many of which are very striking.

Northern Pacific.—A well illustrated pamphlet has been published on the objects, membership and programme of the seventeenth National Irrigational Congress to be held in Spokane, Wash., August 9 to 14, inclusive. Another booklet by this company describes the service on its four daily trains to the Alaska-Yukon-Pacific Exposition and Pacific Coast cities, with diagrams of coaches used and full schedules.

Chicago, Milwaukee & St. Paul.—A booklet, "It Depends on the Line," is for the benefit of the fisherman. The veracity of the stories of big fish given in the descriptive matter is supported by numerous photographs. The same company has published a small folder on its "Pioneer Limited" between Chicago, St. Paul and Minneapolis. A photograph of the train complete, interior views of the coaches and the train schedule are featured.

The Chain Belt Co.—General catalogue No. 37 of the Chain Belt Co., Milwaukee, Wis., an octavo volume of 300 pages bound artistically in dark blue cloth, has been issued. In addition to a complete list and illustrations of the chain belts, sprocket wheels and gears made by the company, 44 pages are given to photographs of actual applications of the chain belt to the needs of many plants, illustrating the possibilities of that form of power transmission.

Highpower Drill.

The Highpower drill is a new high-speed drill made by the Pratt & Whitney Co., Hartford, Conn. The main feature lies in the continuous twist from end to end, and the increased twist shown in the shank, thus permitting its use in the standard Morse or other taper sockets.

The claims made for this drill are as follows: The drill is ground shank and barrel, thus giving it the same accurate alinement as the standard milled drill. It will therefore drill with the same accuracy. As a result of the increased twist in the shank, the effective contact with the socket is greater than with the full-surface shank, and therefore gives greater driving power. The breaking of tangs and slipping of drills in socket is practically impossible.

Tests No. 1 and No. 2 below were made to determine the efficiency of the drill in machinery steel and cast iron, no effort being made to find the limit of the tool. Test No. 3 was made to determine the effective contact between shank and socket, and the general strength of the drill.

In test No. 1, the diameter of the drill was 1¼ in. The material drilled was machinery steel, 3½ in. thick. The cutting speed per

minute was 98 ft., and the feed per revolution of drill, .0145. The inches drilled per minute were 4.2, and 100 holes were drilled. At this point the drill was removed and found to be in practically as good condition as when test commenced.

In test No. 2, the diameter of drill was 1¼ in. The material drilled was cast iron 3 in. thick. The cutting speed per minute was 127 ft., and the feed per revolution of drill .0426. The inches drilled per minute were 14.9, and 211 holes were drilled. At this point the drill was removed and found to be in practically as good condition as when test commenced.

In test No. 3, the diameter of drill was 1 in. The material drilled was cast iron 2¾ in. thick. The cutting speed per minute was 156

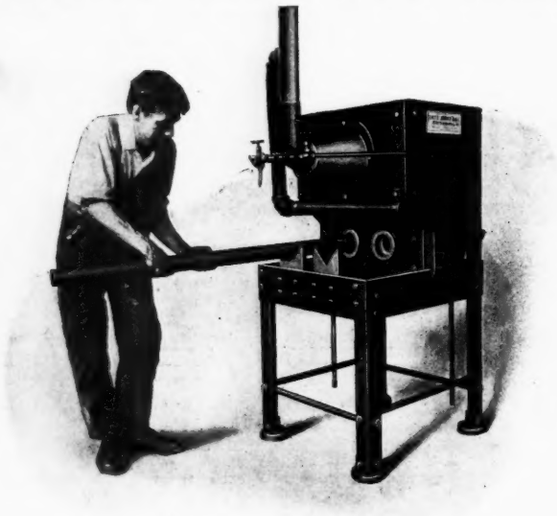
Highpower Drill.

ft., and the feed per revolution of drill .087. The inches drilled per minute were 51.9. The drill was removed after drilling one hole, without a sign of a flaw, and cutting edges found to be in good condition.

Kirkwood Flue Welding Furnace.

The Kirkwood down-flame flue welding furnace, illustrated herewith, has just been put on the market by Tate, Jones & Co., Inc., Pittsburgh, Pa. The burner is applied to an extension combustion chamber so that sufficient room is provided for the complete combustion of the mixed oil and air, and the products of combustion are conducted downward past the flue ends to be heated. It is claimed that in the ordinary type of flue furnace there is always a certain amount of slag from the flues falling down into the combustion chamber and cutting the brick, and in relining these furnaces, which must be done frequently, almost the entire lining must be renewed. In this furnace the slag drops out of the furnace without cutting the brick.

Only one brick at each flue hole ever requires renewing, and this can be replaced without disturbing other parts of the furnace by simply removing two bolts. Fire can be regulated by the operator without changing his position in front of the furnace. A cooling pipe is provided to blow the hot air away from the operator, making



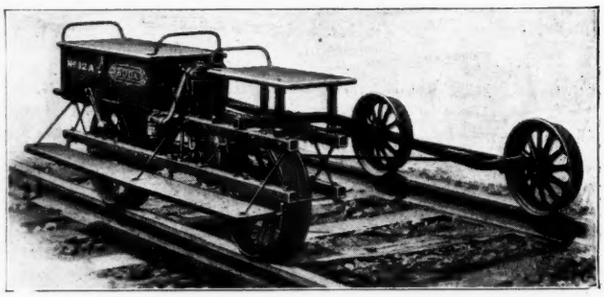
Kirkwood Down-Flame Flue Welding Furnace.

it much easier to work in front of this furnace than other types. Front guides and adjustable back stops are provided to suit the different lengths of pipe.

New Buda Motor Velocipede.

A type of motor velocipede which differs somewhat from the other styles made by the Buda Foundry & Manufacturing Co., Chicago, is the No. 12A, shown herewith, which has just been put on the market. It is a three-man car and is built for heavy service, such as construction and line repair work. The other types of motor velocipedes of this company have a 2½-h.p. engine, but the No. 12A has a 4-h.p. engine. Another difference is the omission of the hand-propelling lever used on the other cars, the character of this particular car making this change advisable.

All the sills are of square steel tubing, held in position by iron X-bracing, bolted. The guide arms are likewise of steel tubing. The car is practically all-steel in its construction, only the seats, tool box and foot board being of wood. This style of construction is but a trifle heavier than wood of proper solidity, size and safe reinforcement, and is considerably stronger. The one and two-man motor



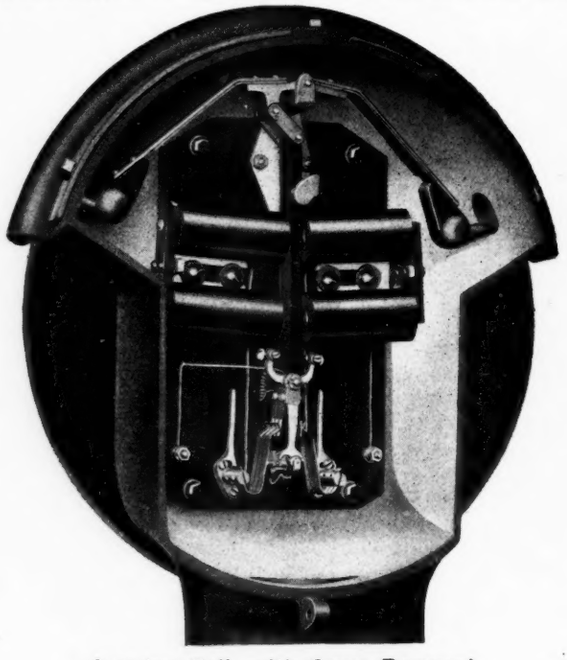
Buda Motor Velocipede.

velocipedes made by the Buda company have only the two lower sills, which carry the engine, made of the steel tubing, this being considered sufficient for the service for which the cars are intended. The 12A car, with its steel framing and 4-h.p. engine, is expected to meet the needs of railway officers who are looking for a heavy-duty three-man car capable of hard service and heavy grade climbing.

A New Highway Crossing Bell.

A new type of bell for highway crossing alarms has recently been put on the market by the Railroad Supply Co., Chicago. It has an 18-in. gong, believed to be the largest highway crossing bell on the market. In place of the usual spring contacts, this bell is equipped with contacts that have an action similar to that of a snap switch for electric lights, the result being that the bell operates on very little current. A two-cell dry battery will work it

The armature hangs between the magnets and is balanced by two heavy iron clappers. It is not connected at all with the contact springs.



Crossing Bell, with Cover Removed.

The distance between the magnets is about 1 in., making such a travel of the armature as to cause the heavy hammers to strike the gong with considerable force. Near the end of its travel, the armature strikes a point on the rocker arm, below the magnets, and tilts it over centers. The rocker arm works on a small wheel near its bottom, which rides over the center. This gives the armature a quick snap motion and changes the circuits of the bell so that the two sides receive current alternately. The bell has a separate weatherproof compartment for the works, contained within the gong, and the latter need not be taken off to make adjustments. The works are tested for insulation with a 3,000-volt alternating current.